



**DEPARTMENT OF THE ARMY**  
U.S. ARMY CORPS OF ENGINEERS, CHARLESTON DISTRICT  
69A HAGOOD AVENUE  
CHARLESTON, SOUTH CAROLINA 29403-5107

**January 12, 2024**

Regulatory Division

Mr. Chris Huffman  
SC Department of Commerce  
1201 Main Street, Suite 1600  
Columbia, South Carolina 29201-3200  
chuffman@sccommerce.com

Dear Mr. Huffman:

Enclosed is your Department of the Army Permit SAC-2023-00690 for the project known as Project Connect (Scout Motors). It authorizes you to perform the work specified in the attached drawings. This permit is issued under provision of Federal laws for the protection and preservation of waters of the United States.

Please notify this office promptly, in writing or via email to Shawn.A.Boone@usace.army.mil, Project Manager, when you start and complete work. Be aware a special condition is included in this permit requiring a copy of the permit and drawings be available at the work site during the entire time of construction.

FOR THE CHIEF, REGULATORY DIVISION Sincerely,

A handwritten signature in black ink that reads "Brad Carey".

Brad J. Carey  
Chief, Special Project

Attachments  
DA Permit SAC-2023-00690

## DEPARTMENT OF THE ARMY PERMIT

Permittee: **Mr. Chris Huffman**  
**1201 Main Street, Suite 1600**  
**SC Department of Commerce**  
**Columbia, South Carolina 29201-3200**  
**chuffman@sccommerce.com**

Permit No: **SAC-2023-00690**

Issuing Office: **CHARLESTON DISTRICT**

**NOTE:** The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

### **Project Description:**

The authorized work consists of the construction and operation of a new rail-served advanced manufacturing facility in the automotive industry for an original equipment manufacturer (OEM), with interchange access. In detail, the proposed work would impact 69.708 acres of wetlands, 38.219 acres of ponds and 35,691 linear feet of tributaries. The site configuration and proposed impacts to wetlands and waters of the U.S. are depicted on the permitted plans. The PRM plan spans three sites and consists of the Sumter Tract, the Shelton Island Tract, and the Congaree River Tract. The mitigation work plans outline site-specific activities (i.e., ecosystem restoration) tailored to the unique resources and impairments present at these three tracts. The Shelton Island Tract is a preservation only tract for both stream and wetlands. All work is to be completed in accordance with attached drawings.

### **Project Location:**

The project is located on a +/- 2,581-acre site south and east of Blythewood Road, east and west of I-77 and west of U.S. 21 in Blythewood, Richland County, South Carolina (Latitude: 34.1946°, Longitude: -80.9890°), Irmo NE quadrangle.

### **General Permit Conditions:**

1. The time limit for completing the work authorized ends on **February 1, 2039**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you



desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

**Special Permit Conditions:**

See Appendix A.

**Further information:**

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403)

Section 404 of the Clean Water Act (33 USC 1344)

Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 USC 1413)

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, State or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.


3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume liability for:

- a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
  - b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
  - c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
  - d. Design or construction deficiencies associated with the permitted work.
  - e. Damage claims associated with any future modification, suspension, or revocation of this permit.
4. Reliance on Applicant's Data. The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.
5. Reevaluation of Permit Decision. The Corps may reevaluate its decision on this permit any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to:
- a. Failure to comply with the terms and conditions of this permit.
  - b. The information provided by you in support of your permit application proves false, incomplete, or inaccurate (See 4 above).
  - c. Significant new information surfaces which the Corps did not consider in reaching the original public interest decision.

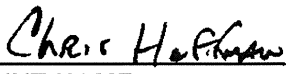
Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by the Corps, and if you fail to comply with such directive, the Corps may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

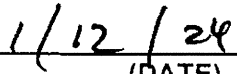
6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

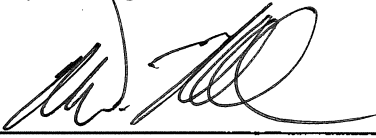
  
\_\_\_\_\_  
(PERMITTEE)

Mr. Chris Huffman  
SC Department of Commerce  
chuffman@sccommerce.com


  
\_\_\_\_\_  
PRINT NAME

  
\_\_\_\_\_  
(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

  
\_\_\_\_\_  
(DISTRICT ENGINEER)

Robert W. Nahabedian  
Lieutenant Colonel, U.S. Army  
Commander and District Engineer  
or their Designee  
Brad J. Carey  
Chief, Special Projects Branch

  
\_\_\_\_\_  
(DATE)

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

\_\_\_\_\_  
(TRANSFEREE) (PRINT NAME)

\_\_\_\_\_  
(DATE)

**APPENDIX A**  
**SPECIAL CONDITIONS FOR PERMIT SAC-2023-00690**

- a. The permittee agrees to provide all contractors associated with construction of the authorized activity a copy of the permit and drawings. A copy of the permit must be available at the construction site at all times.
- b. The permittee shall submit a signed compliance certification to the Corps within 60 days following completion of the authorized work and any required mitigation. The certification will include:
  1. A copy of this permit.
  2. A statement that the authorized work was done in accordance with the Corps authorization, including any general or specific conditions.
  3. A statement that any required mitigation was completed in accordance with the permit conditions.
  4. The signature of the permittee certifying the completion of the work and mitigation.
- c. Prior to beginning the authorized work, the permittee must coordinate with the local NFIP flood plain manager and comply with FEMA requirements. A list of NFIP floodplain managers may be found at: <http://www.dnr.sc.gov/water/flood/index.html>.
- d. The permittee agrees to comply with all FEMA regulations and requirements. The permittee is advised that development activities in a Special Flood Hazard Area (i.e., 100-year floodplain), as designated in the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM), are subject to the floodplain management regulations of the National Flood Insurance Program [(NFIP)(44CFR)].
- e. That the permittee agrees that the drainage/conveyance system shall be designed by a licensed Professional Engineer (PE) and constructed by the permittee (or their designated assignee) to provide for the proper drainage of surface water of the drainage area of which it is a part, to permit the flow of natural or manmade watercourses, and to maintain positive drainage for adjacent properties. In addition, the drainage/conveyance system shall be sufficient to prevent any appreciable increase in water surface elevations or expansion/increases of the flood hazard area.
- f. The permittee recognizes that their commitment to perform and implement the following conditions was a deciding factor in the favorable and timely decision on this permit and recognizes that a failure on their part to both actively pursue and implement these conditions may be grounds for modification, suspension or revocation of this Department of the Army authorization:
  1. That as compensatory mitigation for impacts to aquatic resources, the permittee agrees to purchase or debit a total of 42,510 stream enhancement/restoration credits from the Mill Creek Mitigation Bank.
  2. That in order to fulfill your responsibility to complete the required compensatory mitigation as set forth in Special Condition f.1., the permittee must submit evidence of the purchase or

debit of the required mitigation credits to both the Corps of Engineers and SCDHEC prior to commencement of the authorized work.

3. That as compensatory mitigation for impacts to aquatic resources, the permittee will implement and fully comply with the "Permittee-Responsible Mitigation plan Scout Motors Blythewood Facility" dated December 5, 2023 (the Plan), including the provision to provide \$625,000 for long-term funding into an endowment account. Your responsibility to complete the Plan as set forth in this Special Condition will not be considered fulfilled until you have demonstrated mitigation success and have received written verification from the U.S. Army Corps of Engineers (Corps).
4. The permittee's formal commitment for implementing and maintaining financial assurances in accordance with 33 CFR 332.3(n)(1) provided as part of the Plan for the Congaree River tract. Financial assurances include a performance bond in the amount of \$3,484,061, which includes \$2,726,405 for construction and \$757,656 for monitoring.
5. The permittee's formal commitment for implementing and maintaining financial assurances in accordance with 33 CFR 332.3(n)(1) provided as part of the Plan for the Shelton Island tract. Financial assurances include a performance bond in the amount of \$100,000 for the removal of the house structure on the property.
6. That as compensatory mitigation for the impacts to aquatic resources, the permittee agrees to preserve the entire 4,878 acres at the Congaree River Tract and 143.39 acres at the Shelton Island Tract. Preservation of the Congaree River Tract shall be by means of a conservation easement, while preservation of the Shelton Island Tract shall be by means of restrictive covenants. The respective covenants and easement documents and associated surveyed plats of the mitigation areas must be submitted to the District Engineer or their designee for review and approval prior to execution.
7. That the permittee must submit evidence of the execution and recording of the conservation easements and covenants and associated surveyed plats of the mitigation areas to both the Corps of Engineers and DHEC prior to commencement of the authorized work. Your responsibility to complete the required compensatory mitigation as set forth in Special Condition f.3. will not be considered fulfilled until you have demonstrated mitigation success and have received written verification from the U.S. Army Corps of Engineers.
8. That the permittee understands and agrees that the U.S. Forest Service (USFS) will be the party responsible for ownership and long-term management of the Sumter Tract, and that the permittee further understands and agrees that the USFS is intended to be the party responsible for ownership and long-term management of the Shelton Island Tract. The future transfer of the Shelton Island Tract (and associated long-term management responsibilities) to USFS must be coordinated with the Corps of Engineers prior to any such transfer.
- g. If any previously unknown historic, cultural or archeological remains and artifacts are discovered while accomplishing the activity authorized by this permit, the permittee must immediately notify the district engineer of what has been found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

- h. That the permittee agrees to perform and comply with the signed NHPA Section 106 memorandum of agreement entitled "Memorandum of Agreement Among the U.S. Army Corps of Engineers, Charleston District; The Federal Highway Administration; The South Carolina State Historic Preservation Officer; South Carolina Department of Commerce; and Richland County Regarding Project Connect (Scout Motors) Richland County, South Carolina," and fully executed on December 18, 2023.
- i. That the permittee shall use only clean fill material obtained from an upland source.
- j. That the permittee agrees to utilize best management practices during construction and perform the work as proposed. The permittee must implement practices that will minimize erosion and migration of sediments on and off the project site during and after construction. These practices should include the use of appropriate grading and sloping techniques, mulches, silt fences, or other devices capable of preventing erosion, migration of sediments and bank failure. All disturbed land surfaces and sloped areas affected by the project must be stabilized.
- k. All necessary steps must be taken to prevent oil, tar, trash, debris, and other pollutants from entering the adjacent waters or wetlands.



November 22, 2023

Richland County  
c/o Jeff Ruble  
1201 Main Street, Suite 1110  
Columbia, SC 29201

South Carolina Department of Commerce  
c/o Chris Huffman  
1201 Main Street, Suite 1600  
Columbia, SC 29201

Re: Certification in Accordance with Section 401 of the Clean Water Act, as amended.

Project Connect  
Beasley Creek  
Richland County  
P/N: SAC-2023-00690

Dear Sir or Madam:

South Carolina Department of Health and Environmental Control (DHEC) staff have reviewed plans for this project and determined there is a reasonable assurance that the proposed project will be conducted in a manner consistent with the Certification requirements of Section 401 of the Federal Clean Water Act, as amended.

In accordance with the provisions of Section 401, we certify that this project, subject to the included conditions, is consistent with applicable provisions of Section 401 of the Federal Clean Water Act, and S.C. Code Ann. Regs. 61-101.

This certification is subject to the following conditions:

**401 Water Quality Certification Conditions**

1. The Applicant must implement appropriate best management practices that will minimize erosion and migration of sediments on and off the project site during and after construction. These practices should include the use of appropriate grading and sloping techniques, mulches, silt fences, or other devices capable of preventing erosion, migration of sediments, and bank failure. All disturbed land surfaces and sloped areas affected by the project must be stabilized.
2. All necessary measures must be taken to prevent oil, tar, trash, debris, and other pollutants from entering the adjacent waters, wetlands, or offsite areas.
3. Only clean, earthen material free of all potential sources of pollution may be used as fill in the aquatic impact area.

4. The project must be in compliance with any applicable local floodplain, erosion, and sediment control and/or stormwater ordinances.

5. Mitigation must be provided in accordance with the Permittee Responsible Mitigation (PRM) Plan dated October 30, 2023. Any subsequent revision or modification must be approved by the U.S. Army Corps of Engineers and DHEC.

6. The Applicant must continue coordination with SCDNR with regards to the state threatened spotted turtle.

DHEC reserves the right to impose additional conditions on the Certification to respond to unforeseen, specific problems that might arise and to take any enforcement action to ensure compliance with State water quality standards.

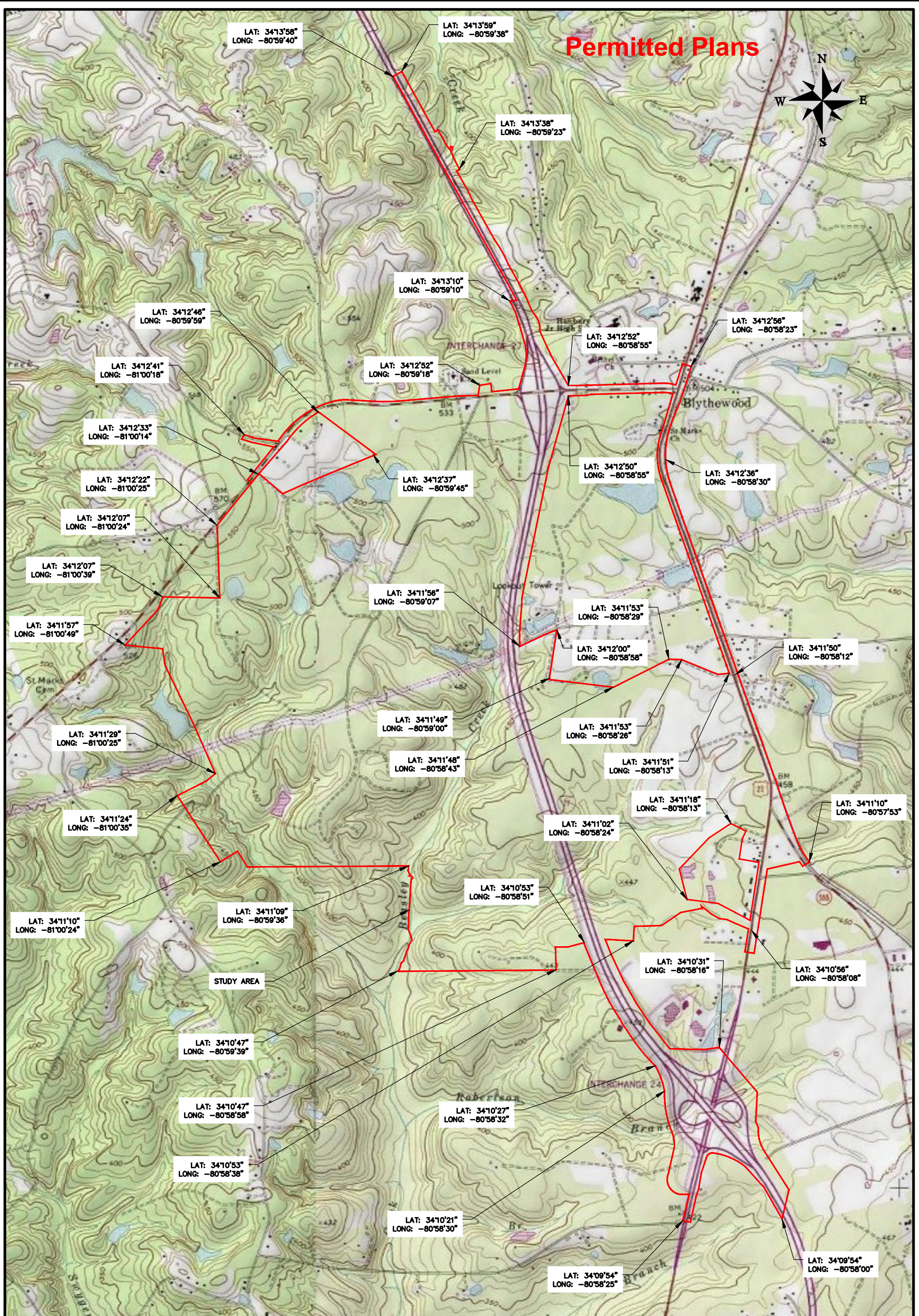
Sincerely,

A handwritten signature in black ink, appearing to read 'Nathan Haber', written over a horizontal line.

Nathan Haber, Director  
Division of Water Quality  
Bureau of Water

cc: US Army Corps of Engineers  
Charleston District Office





**PROJECT CONNECT - PERMIT DRAWINGS**

USGS LOCATION MAP

CLIENT:  
**RICHLAND COUNTY AND STATE OF SC**

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23      DRAWN BY: BEB      SHEET: 1

JOB NUMBER: J-27015.0007      REVIEWED BY: CW      SCALE: 1" = 2000'

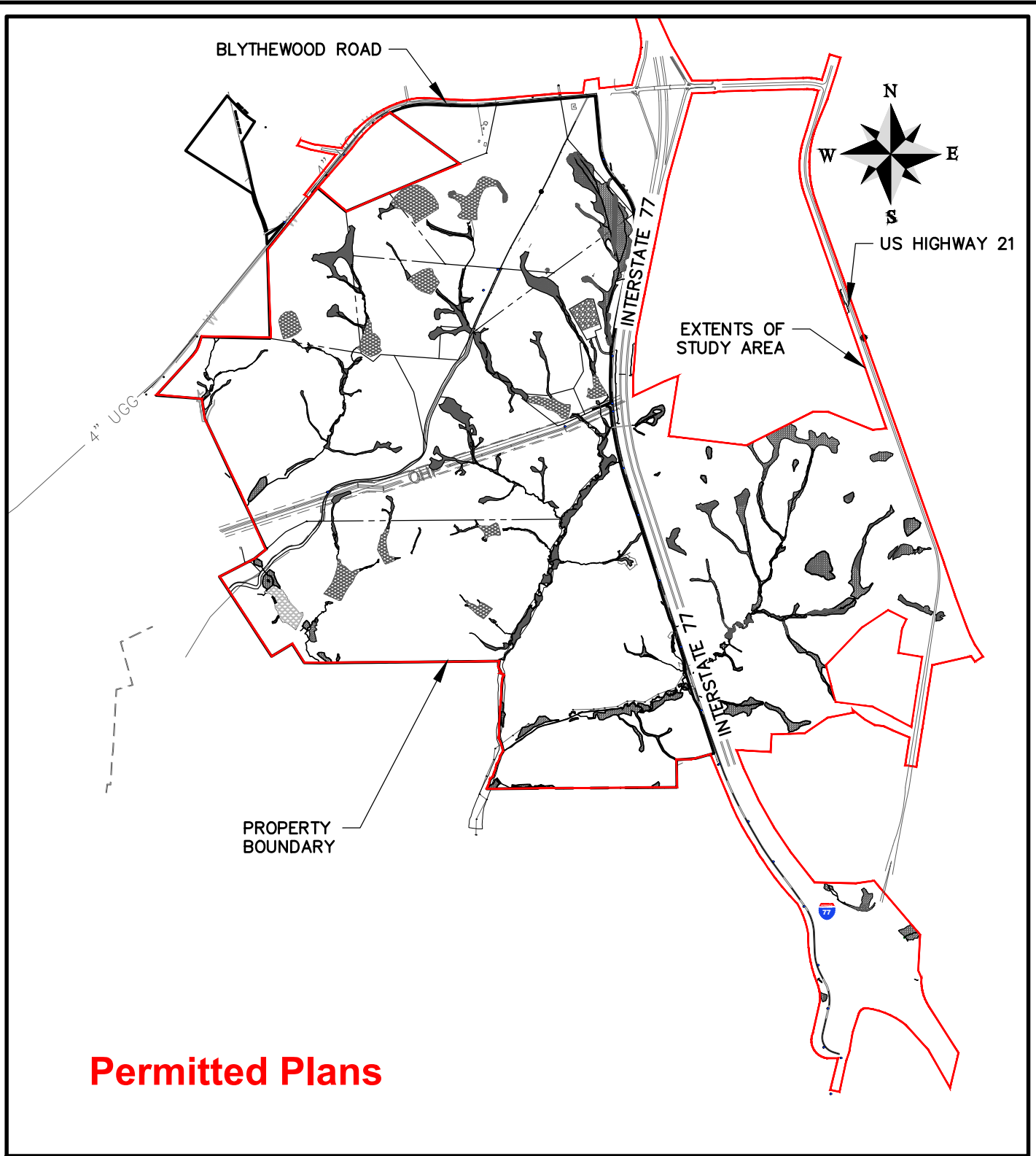


**THOMAS & HUTTON**

1501 Main Street • Suite 760  
 Columbia, SC 29201 • 803.451.6789

www.thomasandhutton.com





## Permitted Plans

### PROJECT CONNECT - PERMIT DRAWINGS

#### EXISTING CONDITIONS

CLIENT:

**RICHLAND COUNTY AND STATE OF SC**

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

SHEET: 2

SCALE: 1" = 2500'



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2: 27015.0007 ENGINEERING DRAWINGS WETLANDS IMPACT OVERALL EXHIBIT - STUDY AREA - SEP 22, 2023 - 11:13 AM



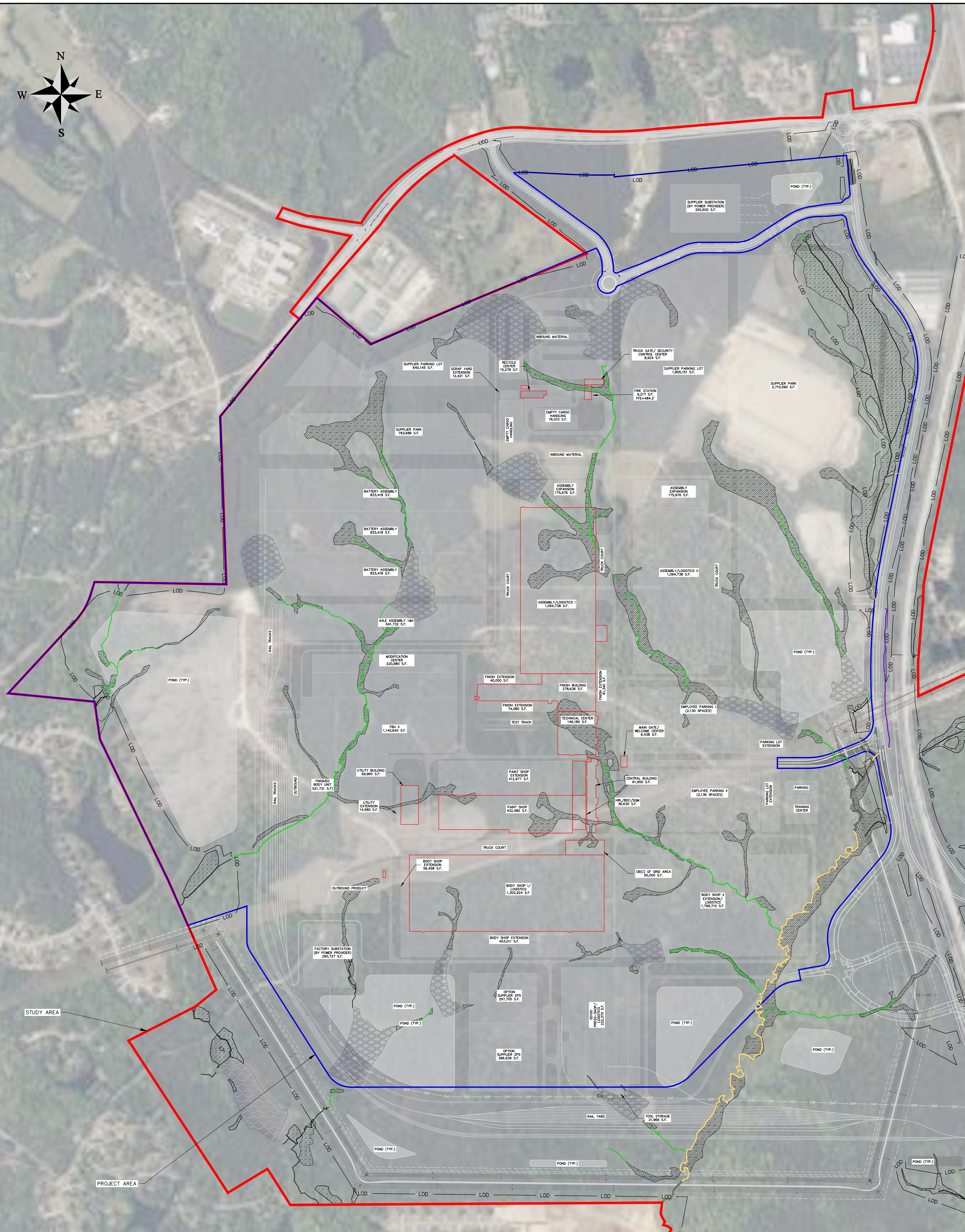
**Permitted Plans**

JURISDICTIONAL IMPACTS		
	WETLAND PERMANENT FILL IMPACT	60.649 AC
	WETLAND PERMANENT CLEARING IMPACT	8.742 AC
	WETLAND TEMPORARY EXCAVATION/PERMANENT CLEARING IMPACT (UNDERGROUND UTILITY IMPACT)	0.317 AC
	NON-WETLAND WATERS (PONDS) PERMANENT FILL IMPACT	38.219 AC
	NON-WETLAND WATERS (TRIBS) MORPHOLOGICAL IMPACT	3,043 LF
	NON-WETLAND WATERS (TRIBS) PERMANENT FILL IMPACT	23,599 LF
	NON-WETLAND WATERS (TRIBS) PIPE IMPACT	9,019 LF
	NON-WETLAND WATERS (TRIBS) TEMPORARY EXCAVATION IMPACT	30 LF

**WETLANDS IMPACT OVERALL EXHIBIT - STUDY AREA**  
 PROJECT CONNECT - PERMIT DRAWINGS  
 BLYTHEWOOD, SC  
 PREPARED FOR:  
 RICHLAND COUNTY AND STATE OF SC  
 PREPARED BY:  
  
 1501 Main Street • Suite 760  
 Columbia, SC 29201 • 803.451.6789  
 www.thomasandhutton.com

JOB NO: J-27015.0007	DATE: 10/27/23
DRAWN: BEB	SCALE: 1" = 800'
REVIEWED: CW	SHEET: 3





**JURISDICTIONAL IMPACTS**

	WETLAND PERMANENT FILL IMPACT	60.649 AC
	WETLAND PERMANENT CLEARING IMPACT	8.742 AC
	WETLAND TEMPORARY EXCAVATION/PERMANENT CLEARING IMPACT (UNDERGROUND UTILITY IMPACT)	0.317 AC
	NON-WETLAND WATERS (PONDS) PERMANENT FILL IMPACT	38.219 AC
	NON-WETLAND WATERS (TRIBS) MORPHOLOGICAL IMPACT	3,043 LF
	NON-WETLAND WATERS (TRIBS) PERMANENT FILL IMPACT	23,599 LF
	NON-WETLAND WATERS (TRIBS) PIPE IMPACT	9,019 LF
	NON-WETLAND WATERS (TRIBS) TEMPORARY EXCAVATION IMPACT	30 LF

**BUILDING PHASE LEGEND**

PHASE 1

FUTURE BUILD-OUT

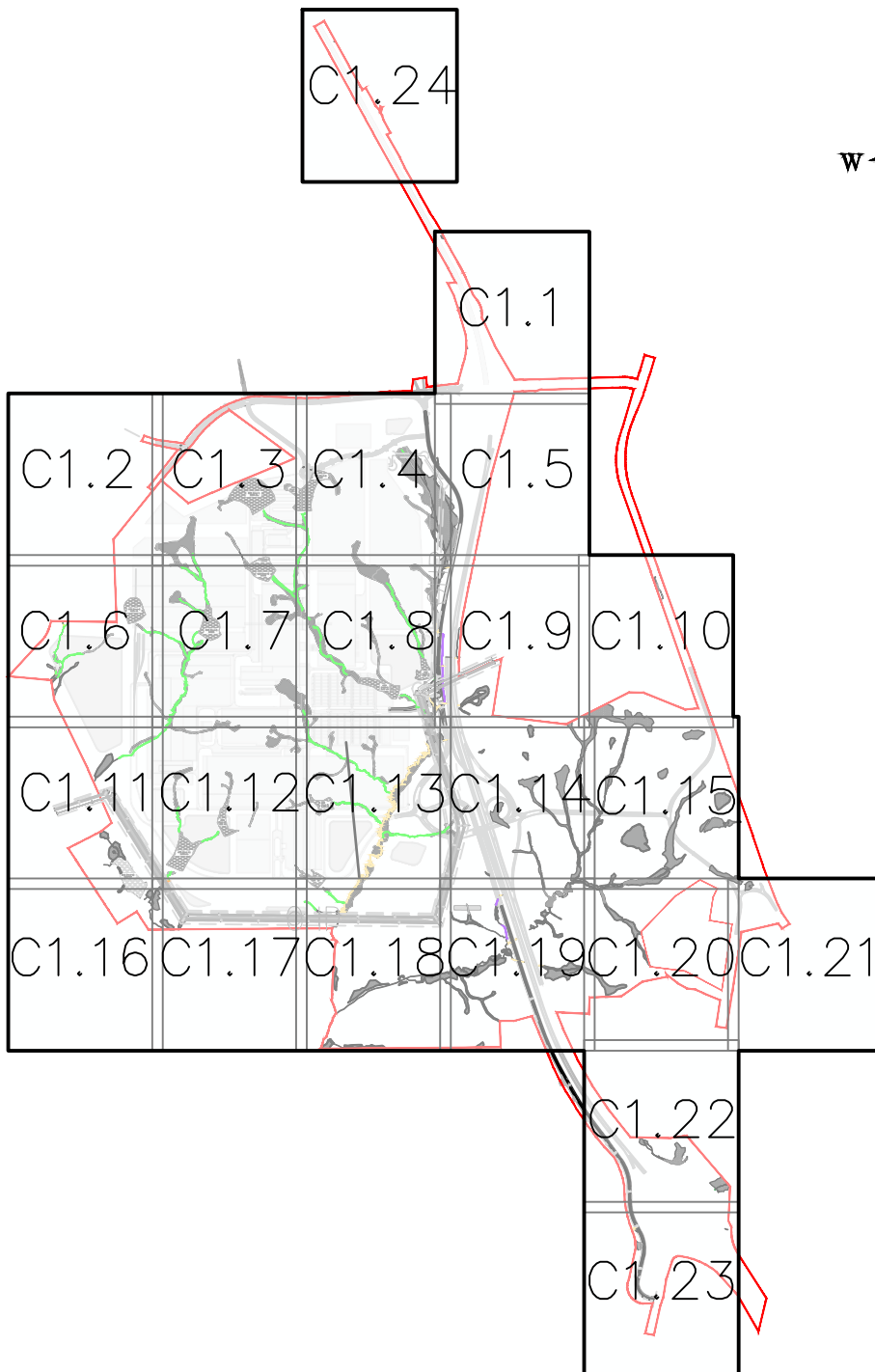
**Permitted Plans**

**WETLANDS IMPACT OVERALL EXHIBIT - PROJECT AREA**

PROJECT CONNECT - PERMIT DRAWINGS  
 BLYTHEWOOD, SC  
 PREPARED FOR:  
 RICHLAND COUNTY AND STATE OF SC  
 PREPARED BY:

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 Columbia, SC 29201 • 803.451.6789  
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## Permitted Plans

### PROJECT CONNECT - PERMIT DRAWINGS

#### OVERALL SHEET INDEX

CLIENT:

RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

SHEET: 5

SCALE: 1" = 3500'



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




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JURISDICTIONAL WETLANDS



JURISDICTIONAL NON-WETLAND WATERS (NWW) (PONDS)

JURISDICTIONAL IMPACTS		TOTAL	IN PIEDMONT ECO- REGION	IN SANDHILLS ECO- REGION
	WETLAND PERMANENT FILL IMPACT	60.649 AC.	1.711 AC.	58.938 AC.
	WETLAND PERMANENT CLEARING IMPACT	8.742 AC.	0.289 AC.	8.453 AC.
	WETLAND TEMPORARY EXCAVATION/ PERMANENT CLEARING IMPACT (UNDERGROUND UTILITY IMPACT)	0.317 AC.	0.066 AC.	0.251 AC.
	NON-WETLAND WATERS (PONDS) PERMANENT FILL IMPACT	38.219 AC.	1.099 AC.	37.120 AC.
	NON-WETLAND WATERS (TRIBS) MORPHOLOGICAL IMPACT	3,043 LF	0 LF	3,043 LF
	NON-WETLAND WATERS (TRIBS) PERMANENT FILL IMPACT	23,599 LF	783 LF	22,816 LF
	NON-WETLAND WATERS (TRIBS) PIPE IMPACT	9,019 LF	946 LF	8,073 LF
	NON-WETLAND WATERS (TRIBS) TEMPORARY EXCAVATION IMPACT	30 LF	30 LF	0 LF

## Permitted Plans

PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACT TABLE

CLIENT:

RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

DRAWN BY: BEB

SHEET: 6

JOB NUMBER: J-27015.0007

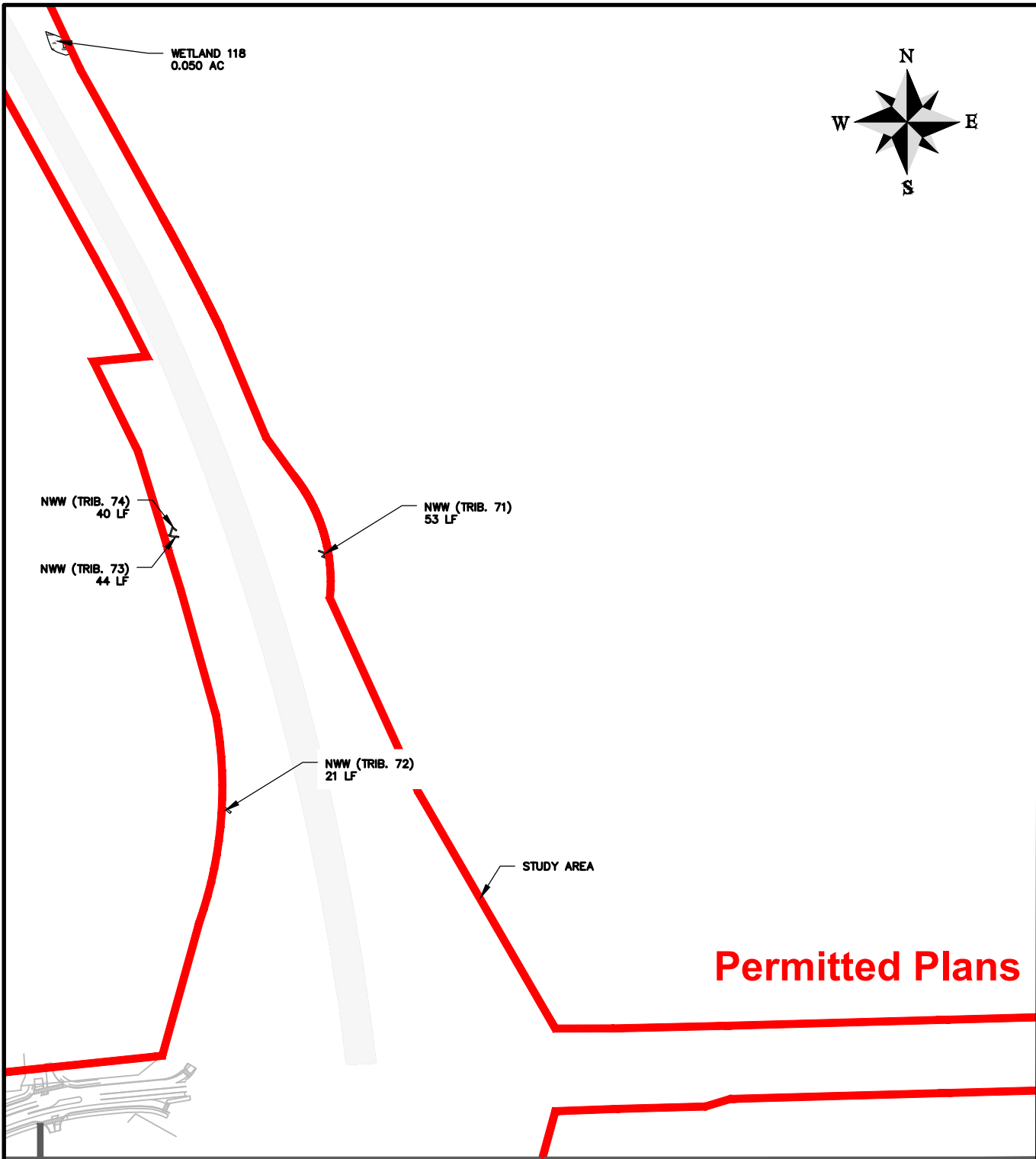
REVIEWED BY: CW

SCALE: N/A



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MATCH LINE - SEE SHEET NO. 1.4

PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:

RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

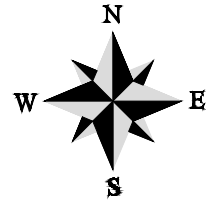
REVIEWED BY: CW

SHEET: 1.1

SCALE: 1" = 400'



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STUDY AREA

IMPACT #38  
WETLAND FILL  
7.340 AC.

MATCH LINE - SEE SHEET NO. 1.3

MATCH LINE - SEE SHEET NO. 1.6

# Permitted Plans

## PROJECT CONNECT - PERMIT DRAWINGS

### AQUATIC FEATURES IMPACTS

CLIENT:

**RICHLAND COUNTY AND STATE OF SC**

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

SHEET: 1.2

SCALE: 1" = 400'



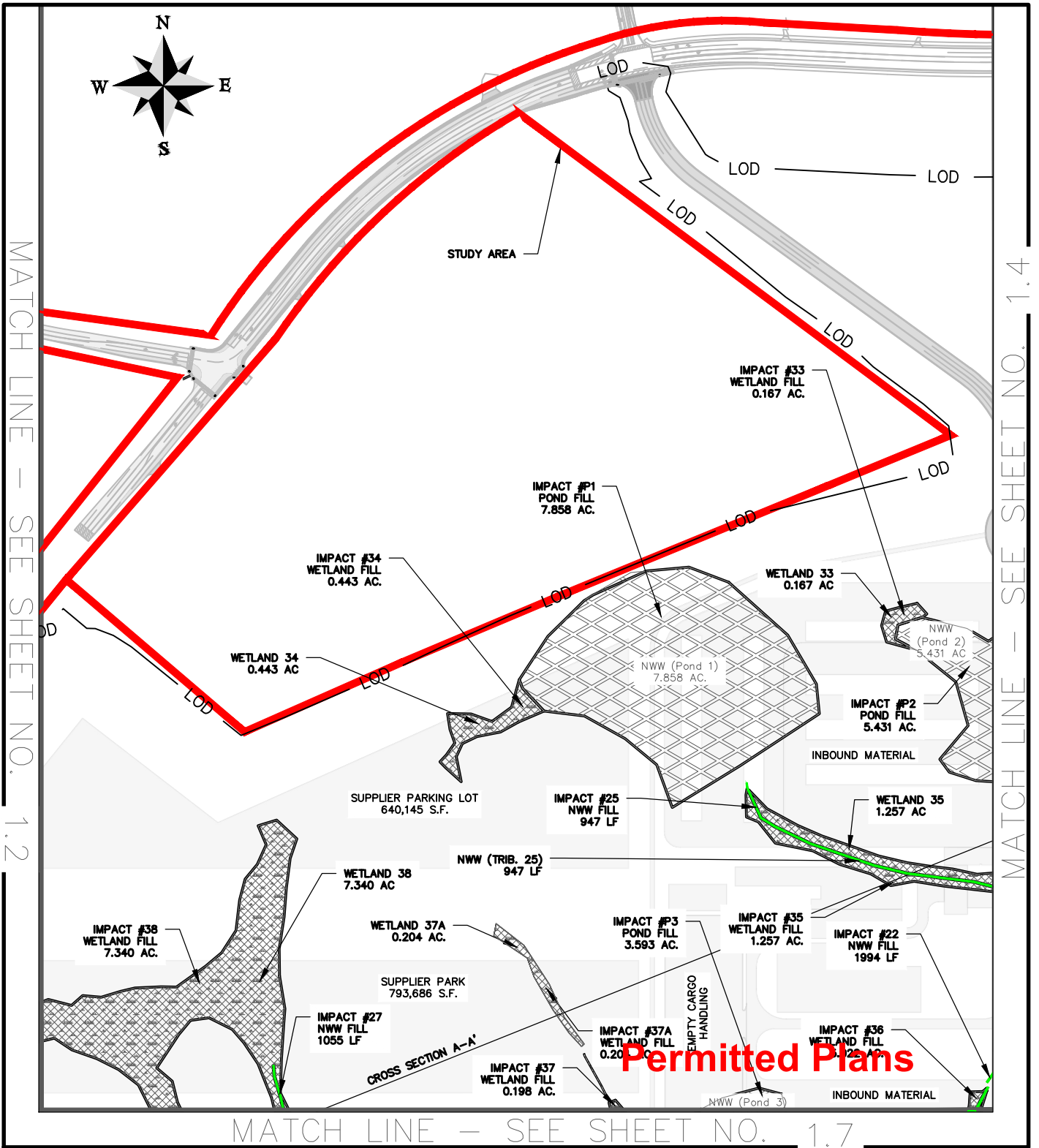
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MATCH LINE - SEE SHEET NO. 1.2

MATCH LINE - SEE SHEET NO. 1.4



MATCH LINE - SEE SHEET NO. 1.7

**Permitted Plans**

PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:  
 RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC  
 DATE: 10/27/23  
 JOB NUMBER: J-27015.0007

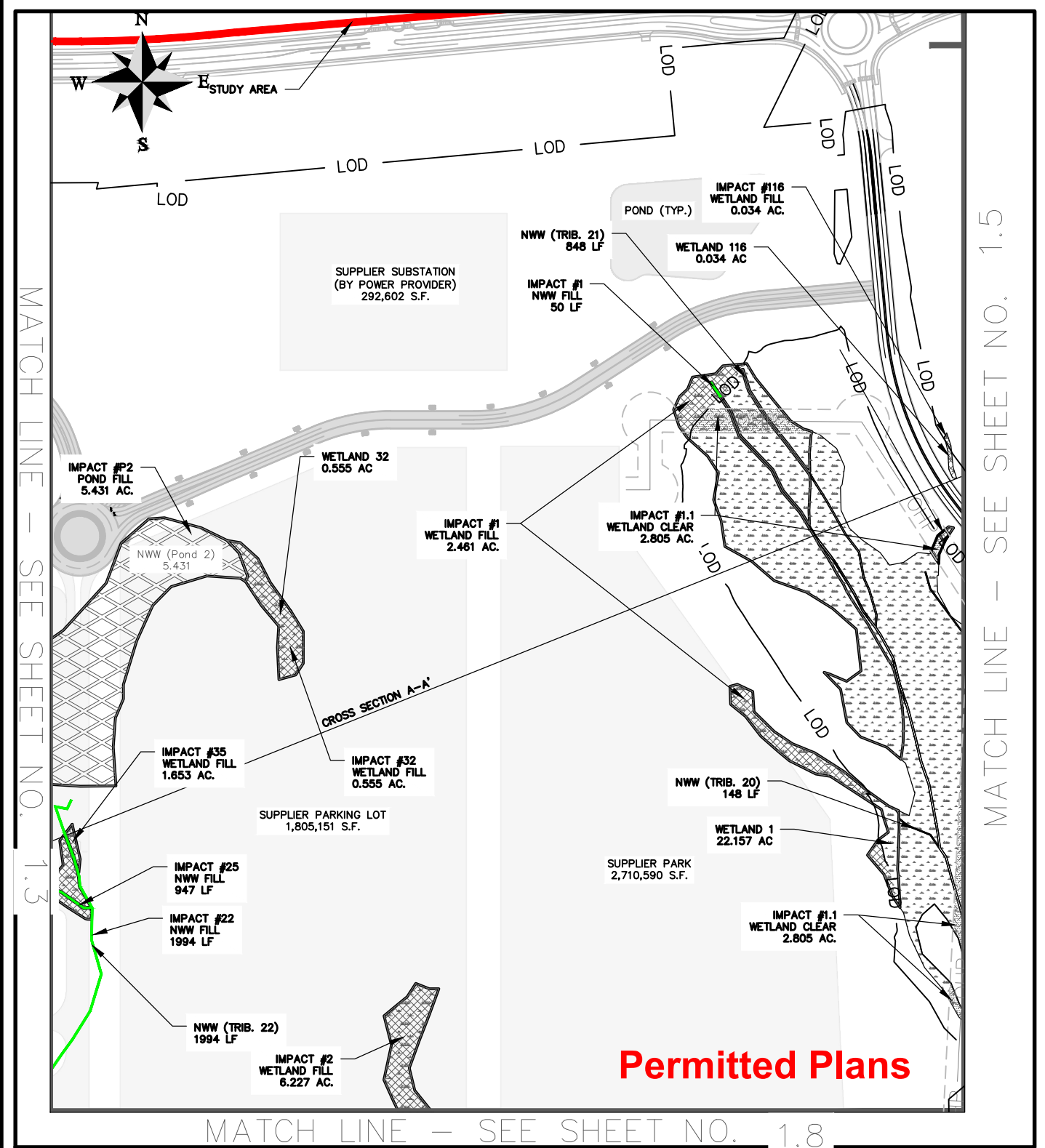
DRAWN BY: BEB  
 REVIEWED BY: CW

SHEET: 1.3  
 SCALE: 1" = 400'



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**Permitted Plans**

**PROJECT CONNECT - PERMIT DRAWINGS**

**AQUATIC FEATURES IMPACTS**

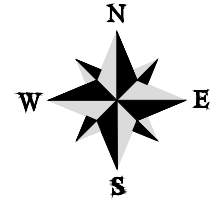
CLIENT:  
**RICHLAND COUNTY AND STATE OF SC**  
 LOCATION: BLYTHEWOOD, SC  
 DATE: 10/27/23  
 JOB NUMBER: J-27015.0007

DRAWN BY: BEB  
 REVIEWED BY: CW  
 SHEET: 1.4  
 SCALE: 1" = 400'

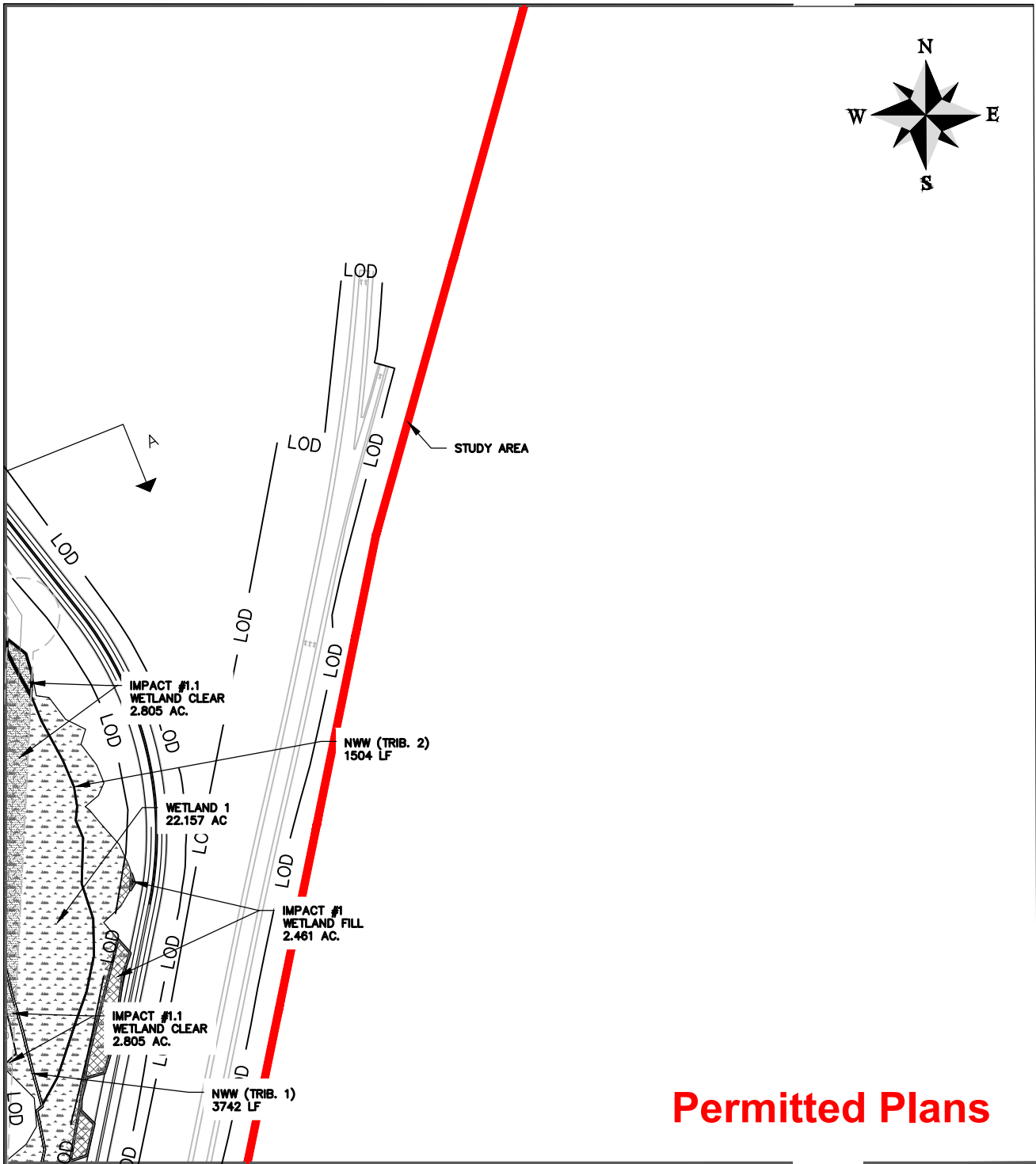


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MATCH LINE - SEE SHEET NO. 1.1



MATCH LINE - SEE SHEET NO. 1.4



**Permitted Plans**

MATCH LINE - SEE SHEET NO. 1.9

PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:  
RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

SHEET: 1.5

SCALE: 1" = 400'

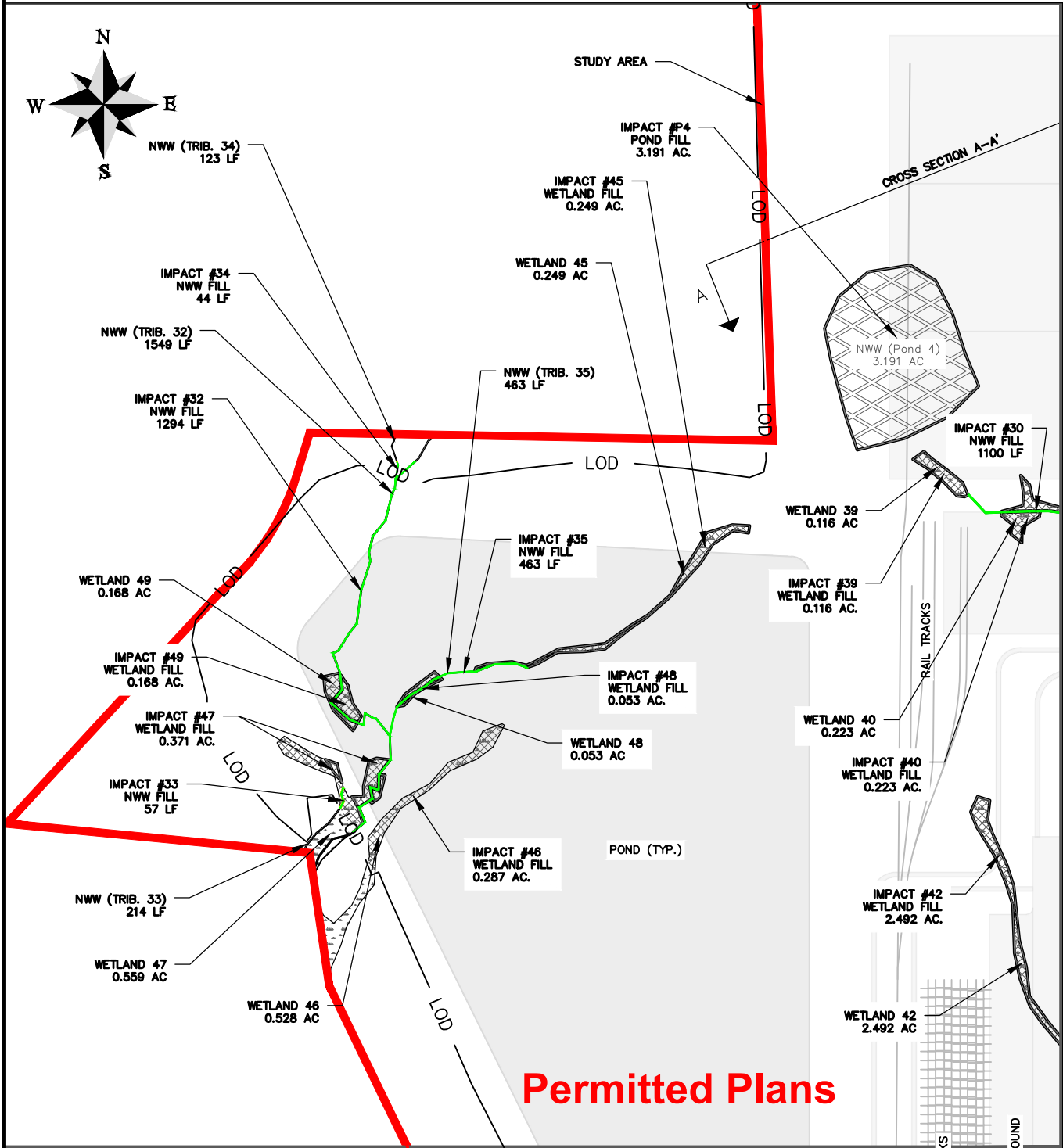


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MATCH LINE - SEE SHEET NO. 1.2



**Permitted Plans**

MATCH LINE - SEE SHEET NO. 1.11

MATCH LINE - SEE SHEET NO. 1.7

PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:  
RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC  
DATE: 10/27/23  
JOB NUMBER: J-27015.0007  
DRAWN BY: BEB  
REVIEWED BY: CW  
SHEET: 1.6  
SCALE: 1" = 400'

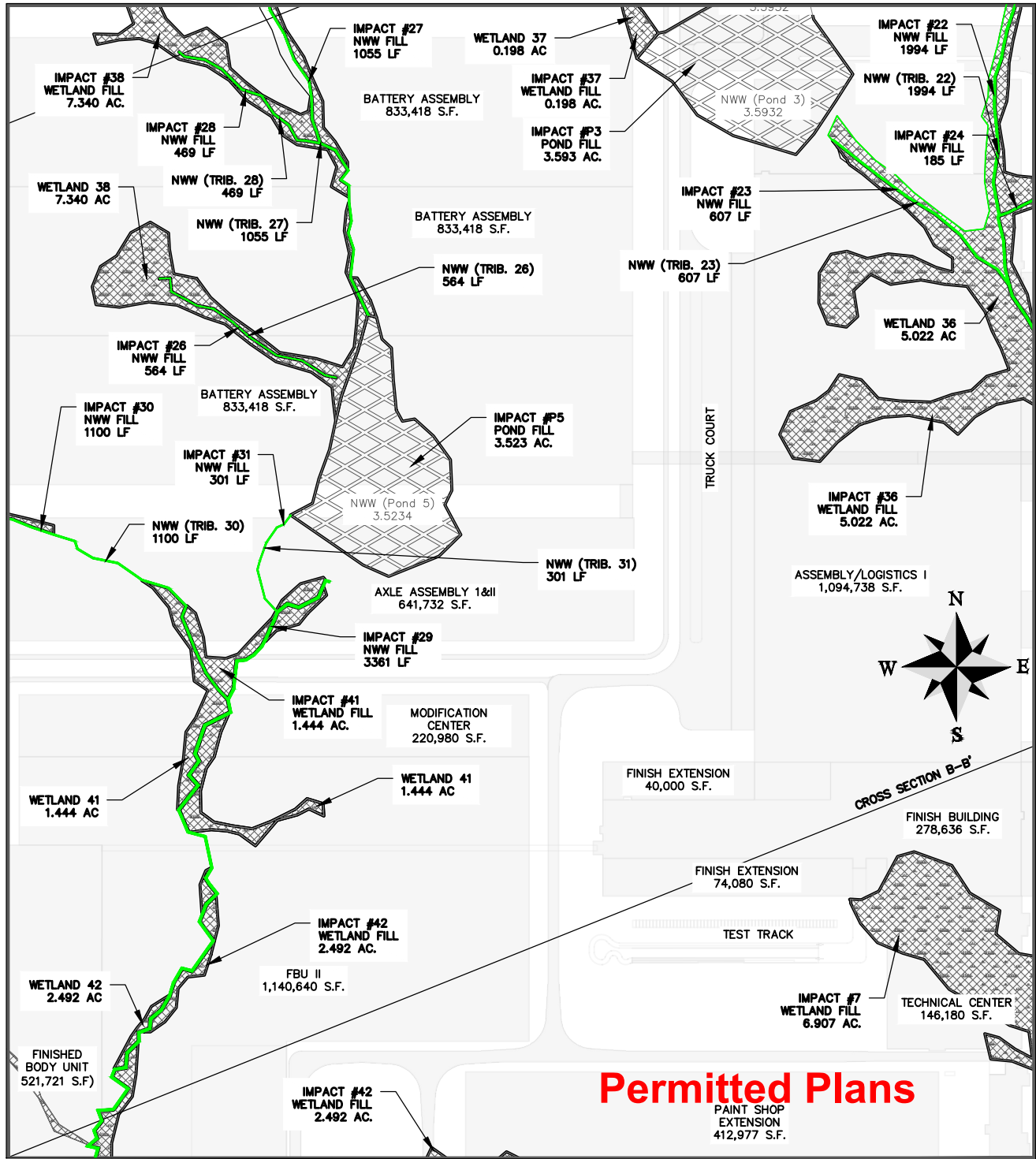


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MATCH LINE - SEE SHEET NO. 1.3

MATCH LINE - SEE SHEET NO. 1.6

MATCH LINE - SEE SHEET NO. 1.8



**Permitted Plans**

MATCH LINE - SEE SHEET NO. 1.12

PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:  
RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

SHEET: 1.7

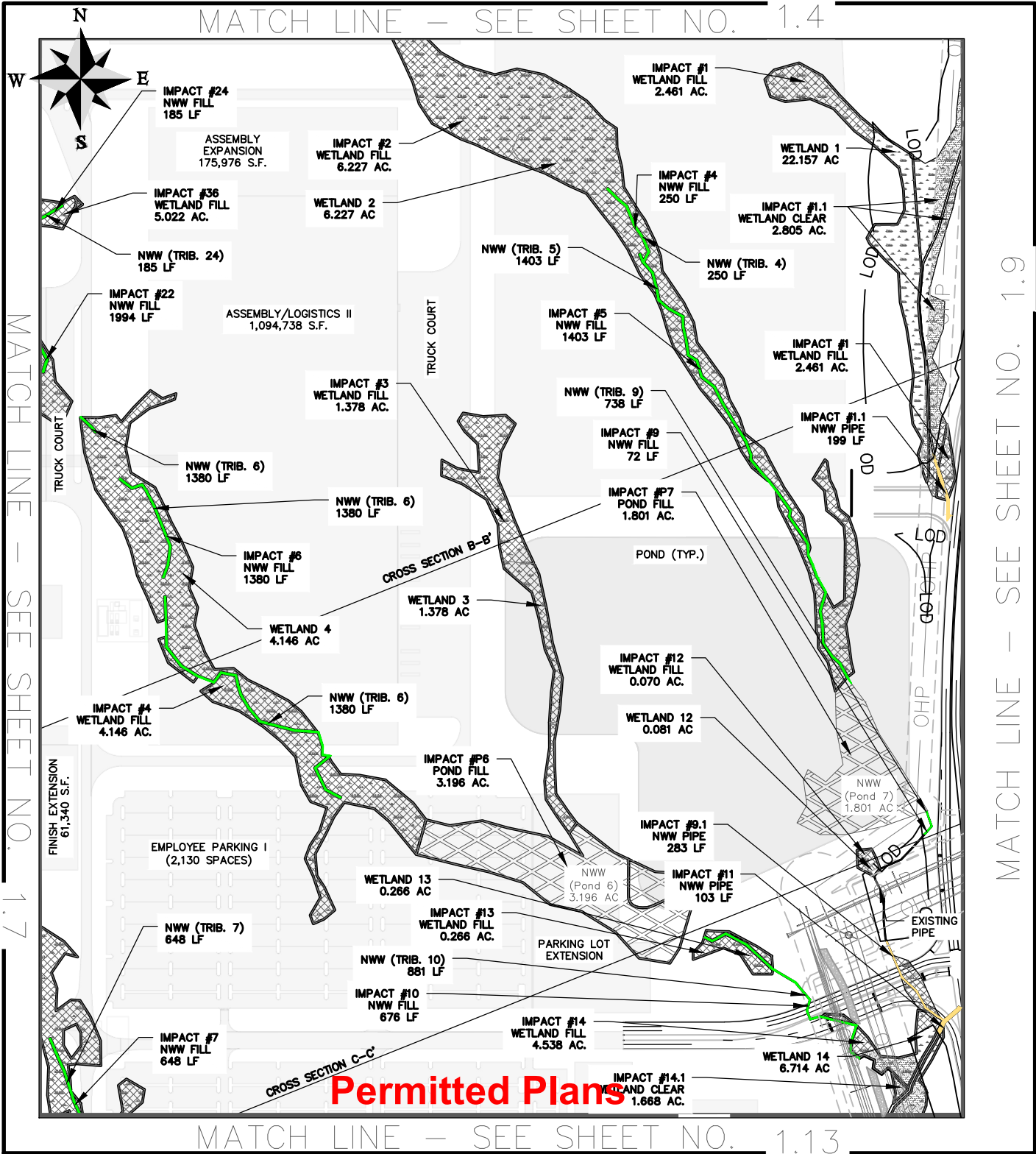
SCALE: 1" = 400'



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PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:  
RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

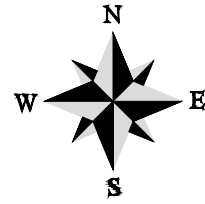
SHEET: 1.8

SCALE: 1" = 400'



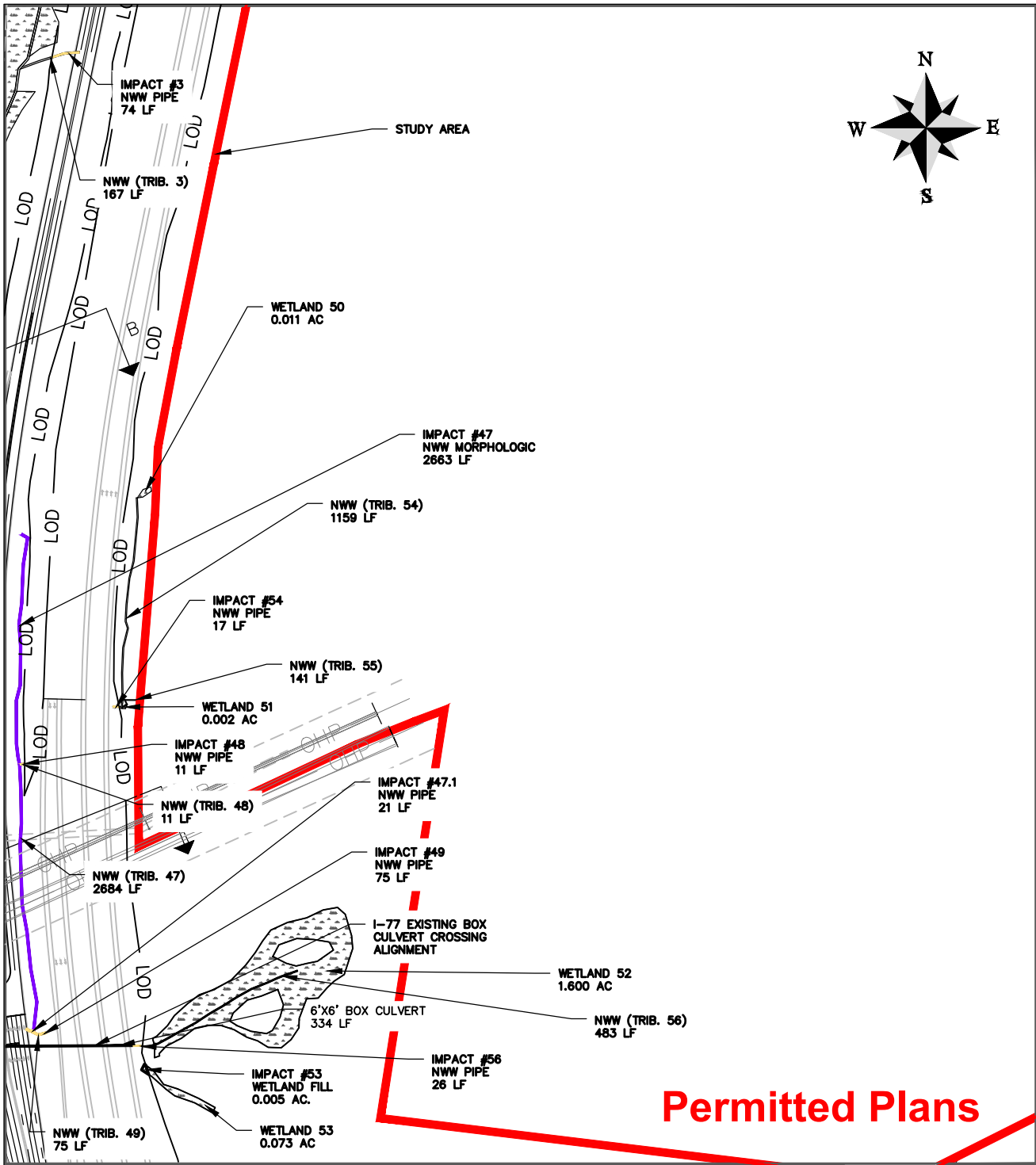
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MATCH LINE - SEE SHEET NO. 1.5



MATCH LINE - SEE SHEET NO. 1.8

MATCH LINE - SEE SHEET NO. 1.10



**Permitted Plans**

MATCH LINE - SEE SHEET NO. 1.14

PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:  
RICHLAND COUNTY AND STATE OF SC

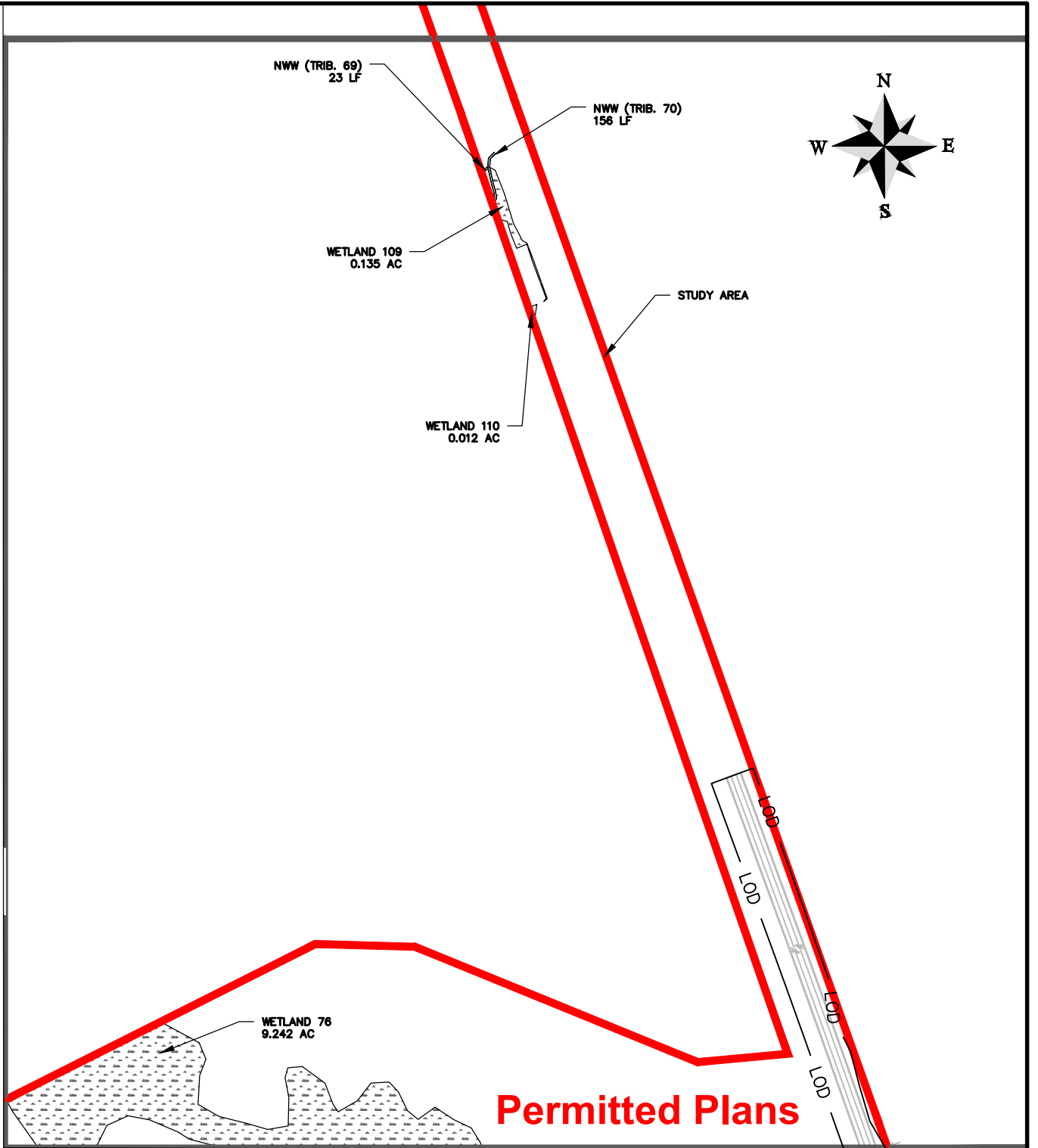
LOCATION: BLYTHEWOOD, SC  
DATE: 10/27/23  
JOB NUMBER: J-27015.0007  
DRAWN BY: BEB  
REVIEWED BY: CW  
SHEET: 1.9  
SCALE: 1" = 400'



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MATCH LINE - SEE SHEET NO. 1.9



MATCH LINE - SEE SHEET NO. 1.15

PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:

RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

SHEET: 1.10

SCALE: 1" = 400'

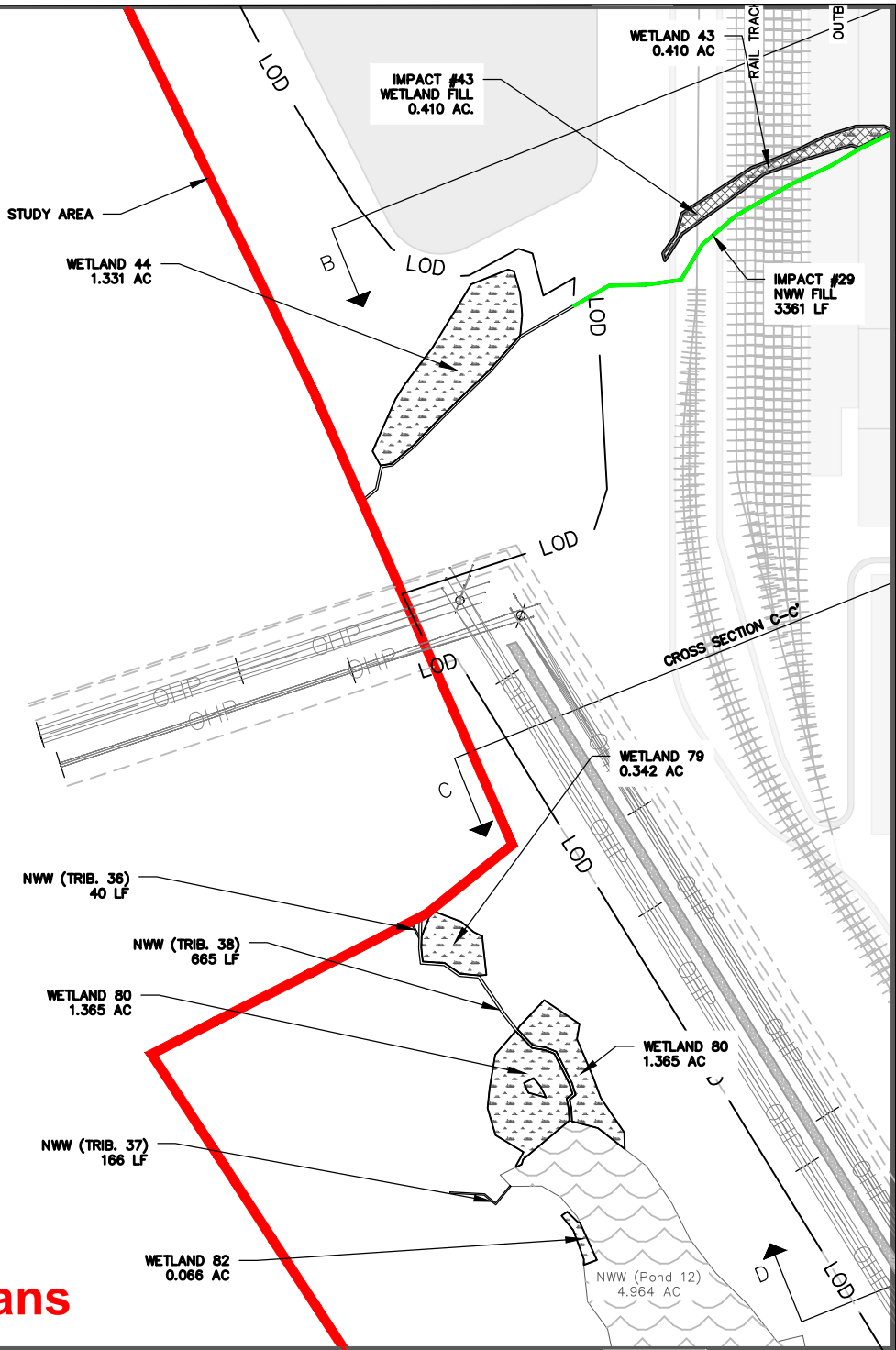
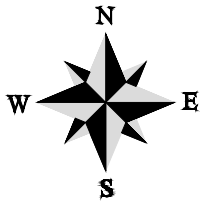


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MATCH LINE - SEE SHEET NO. 1.6



MATCH LINE - SEE SHEET NO. 1.12

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MATCH LINE - SEE SHEET NO. 1.16

PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:  
RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

SHEET: 1.11

SCALE: 1" = 400'

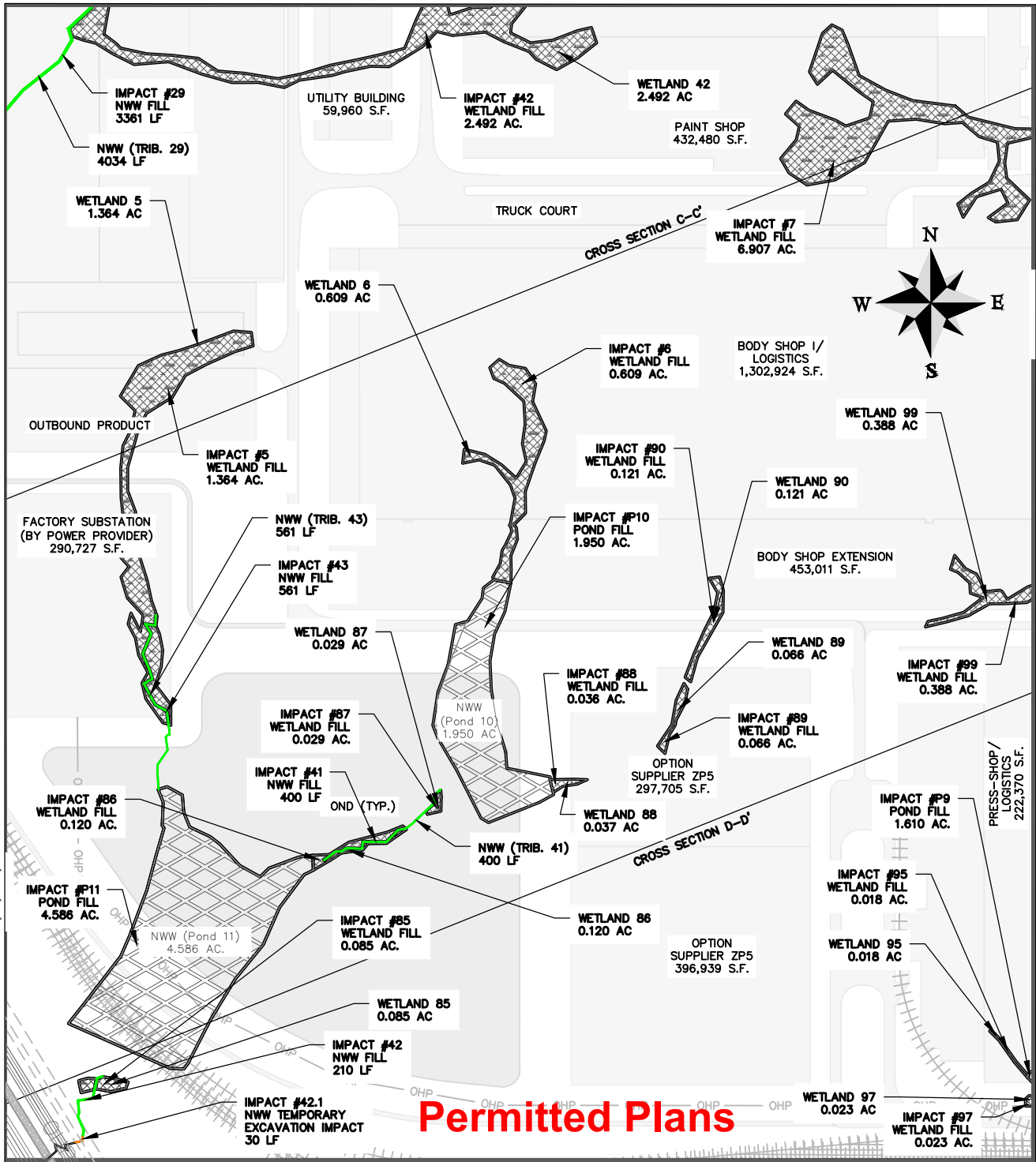


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MATCH LINE - SEE SHEET NO. 1.7

MATCH LINE - SEE SHEET NO. 1.11

MATCH LINE - SEE SHEET NO. 1.13



**Permitted Plans**

MATCH LINE - SEE SHEET NO. 1.17

PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:  
RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC  
DATE: 10/27/23  
JOB NUMBER: J-27015.0007

DRAWN BY: BEB  
REVIEWED BY: CW

SHEET: 1.12  
SCALE: 1" = 400'



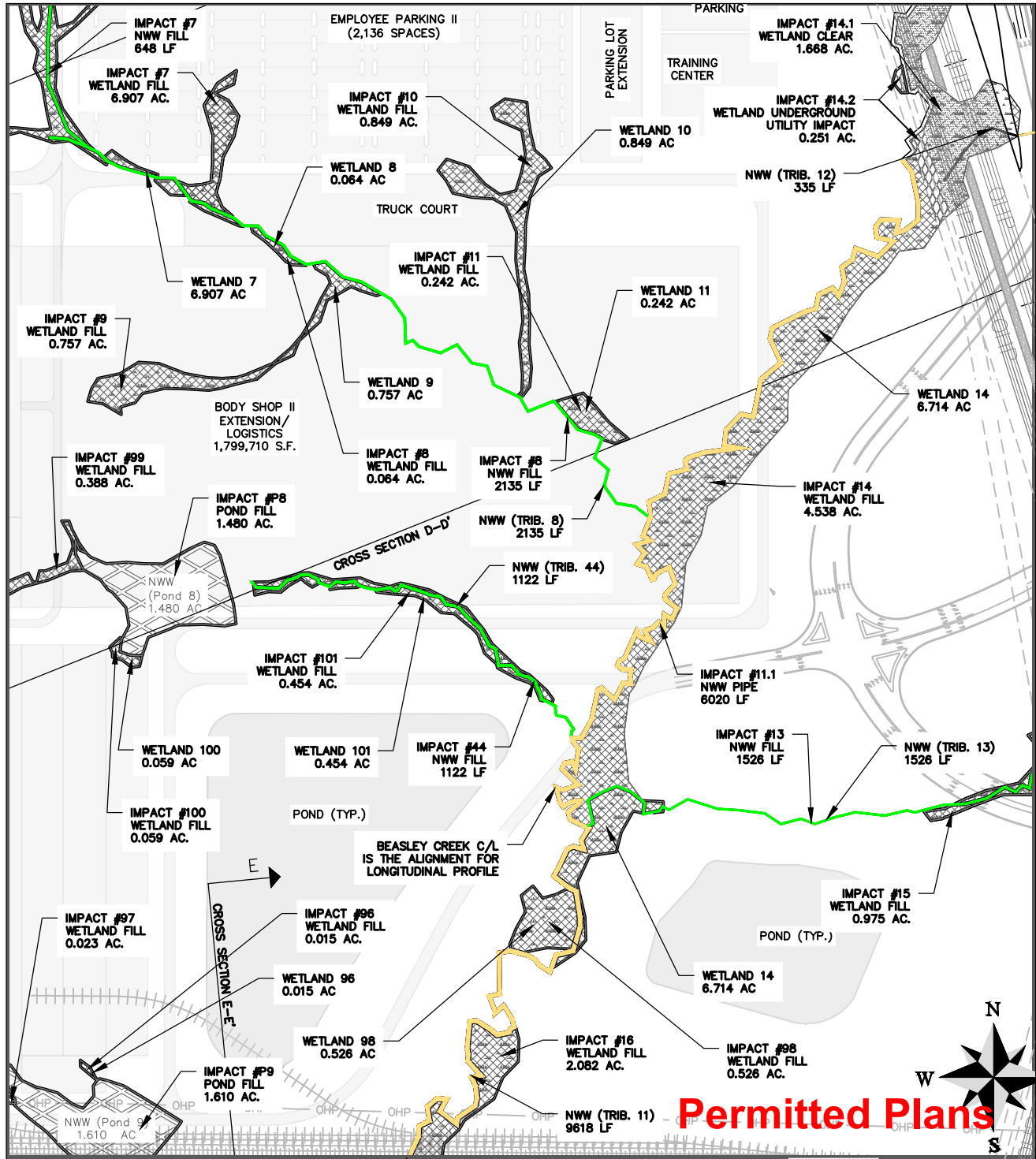
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MATCH LINE - SEE SHEET NO. 1.8

MATCH LINE - SEE SHEET NO. 1.12

MATCH LINE - SEE SHEET NO. 1.14



MATCH LINE - SEE SHEET NO. 1.18

PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:  
RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

SHEET: 1.13

SCALE: 1" = 40'



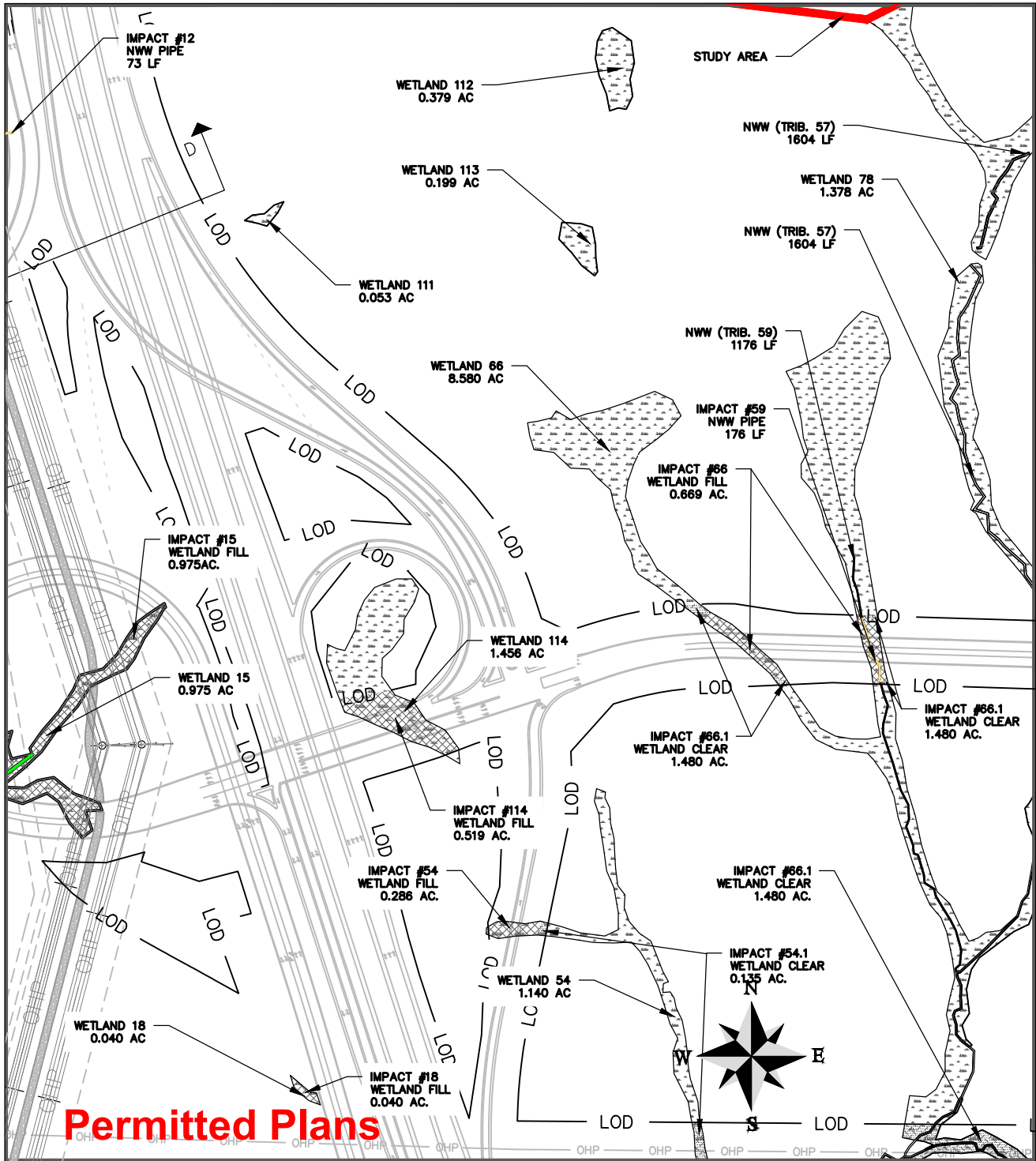
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MATCH LINE - SEE SHEET NO. 1.9

MATCH LINE - SEE SHEET NO. 1.13

MATCH LINE - SEE SHEET NO. 1.15



**Permitted Plans**

MATCH LINE - SEE SHEET NO. 1.19

PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:  
RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

SHEET: 1.14

SCALE: 1" = 400'

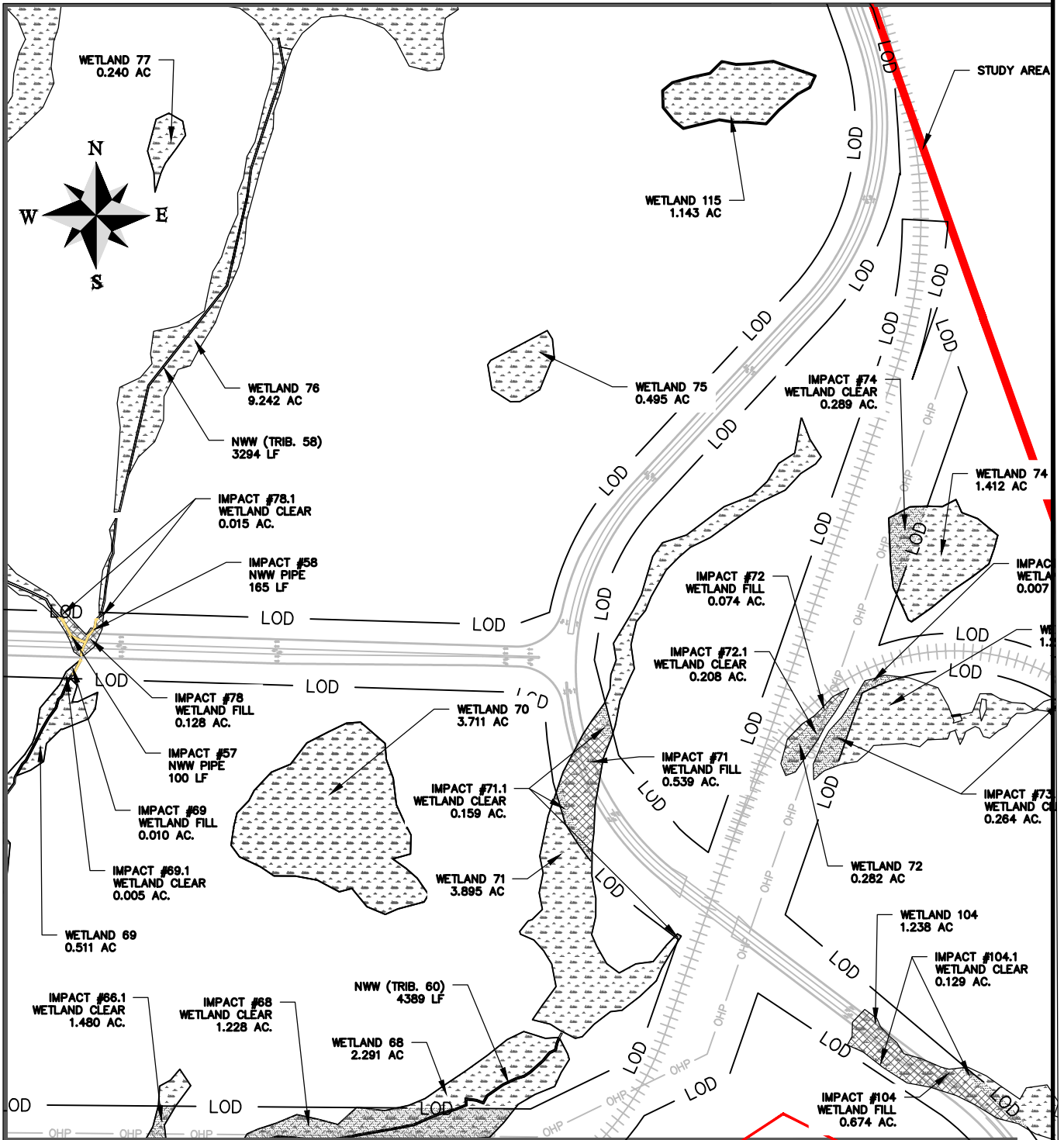


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MATCH LINE - SEE SHEET NO. 1.10

MATCH LINE - SEE SHEET NO. 1.14



MATCH LINE - SEE SHEET NO. 1.20

PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:  
RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

SHEET: 1.15

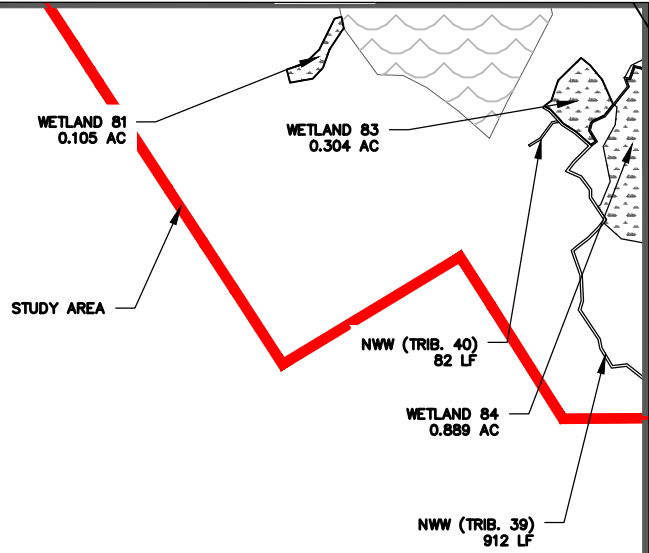
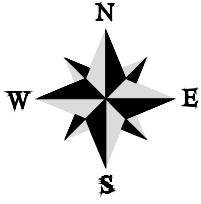
SCALE: 1" = 400'



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MATCH LINE - SEE SHEET NO. 1.11



MATCH LINE - SEE SHEET NO. 1.17

## Permitted Plans

PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:

RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

DRAWN BY: BEB

SHEET: 1.16

JOB NUMBER: J-27015.0007

REVIEWED BY: CW

SCALE: 1" = 400'

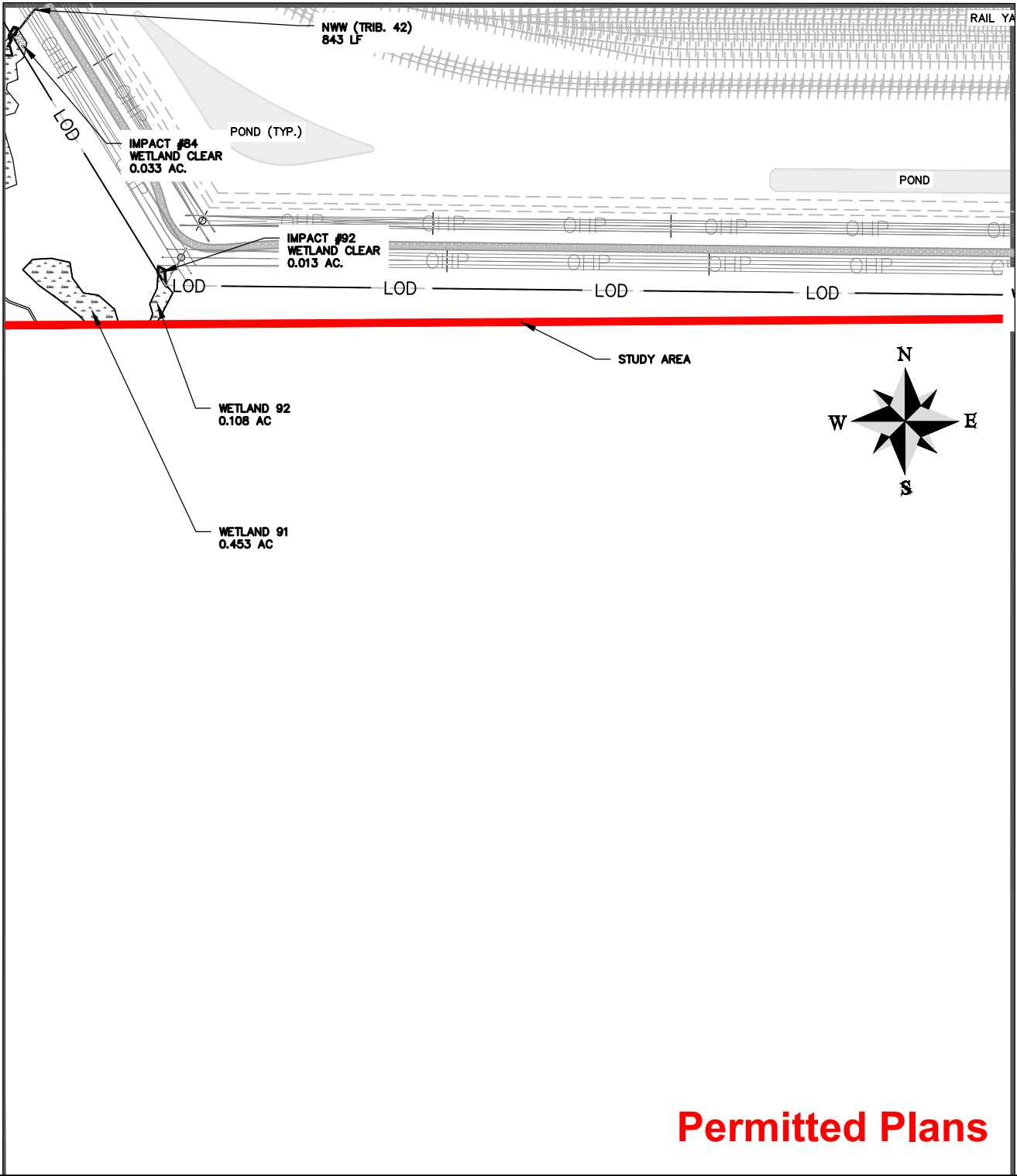


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MATCH LINE - SEE SHEET NO. 1.12

MATCH LINE - SEE SHEET NO. 1.16

MATCH LINE - SEE SHEET NO. 1.18



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PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:

RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

DRAWN BY: BEB

SHEET: 1.17

JOB NUMBER: J-27015.0007

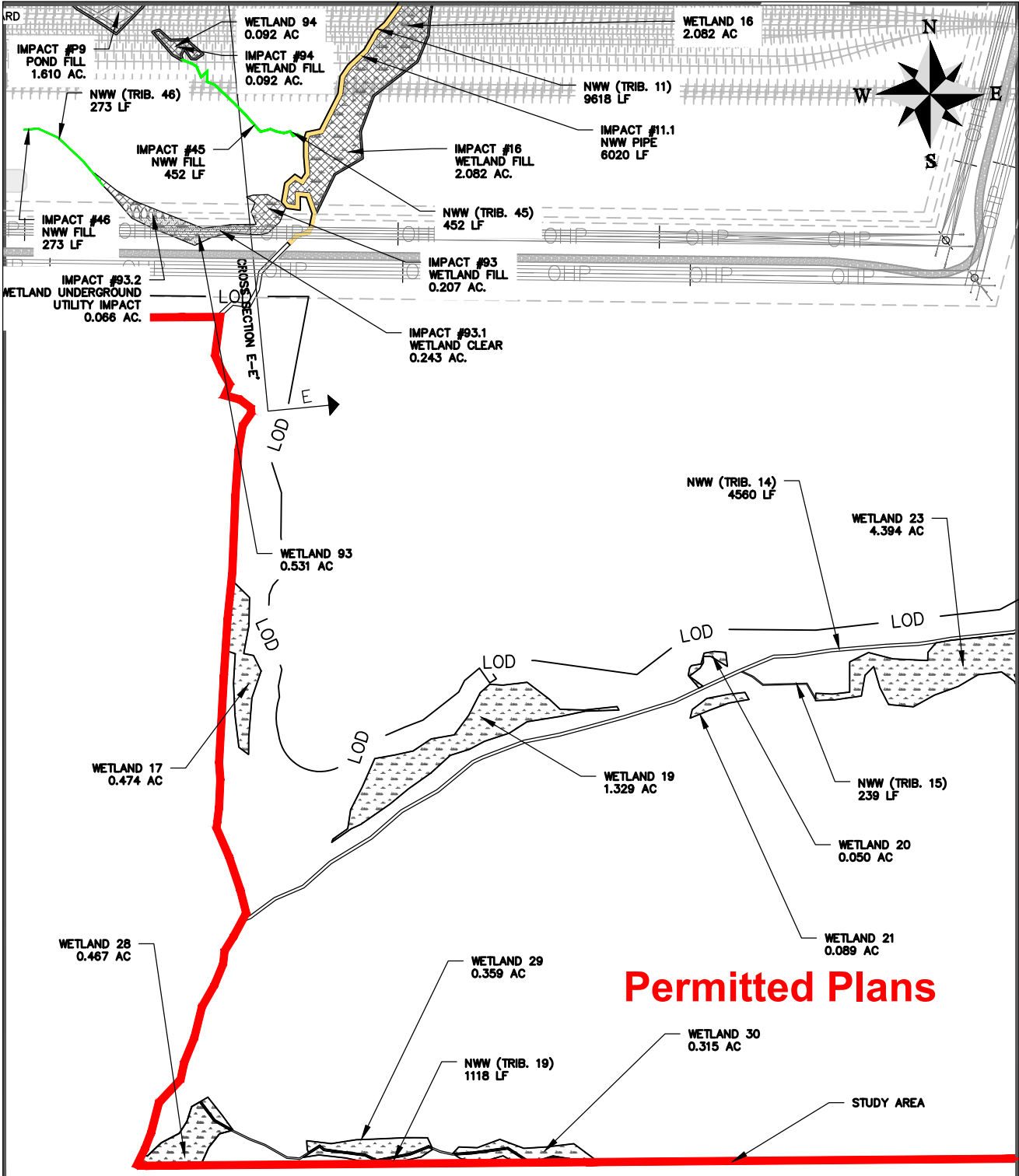
REVIEWED BY: CW

SCALE: 1" = 400'



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MATCH LINE - SEE SHEET NO. 1.13



MATCH LINE - SEE SHEET NO. 1.17

MATCH LINE - SEE SHEET NO. 1.19

**Permitted Plans**

PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:  
RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

SHEET: 1.18

SCALE: 1" = 400'



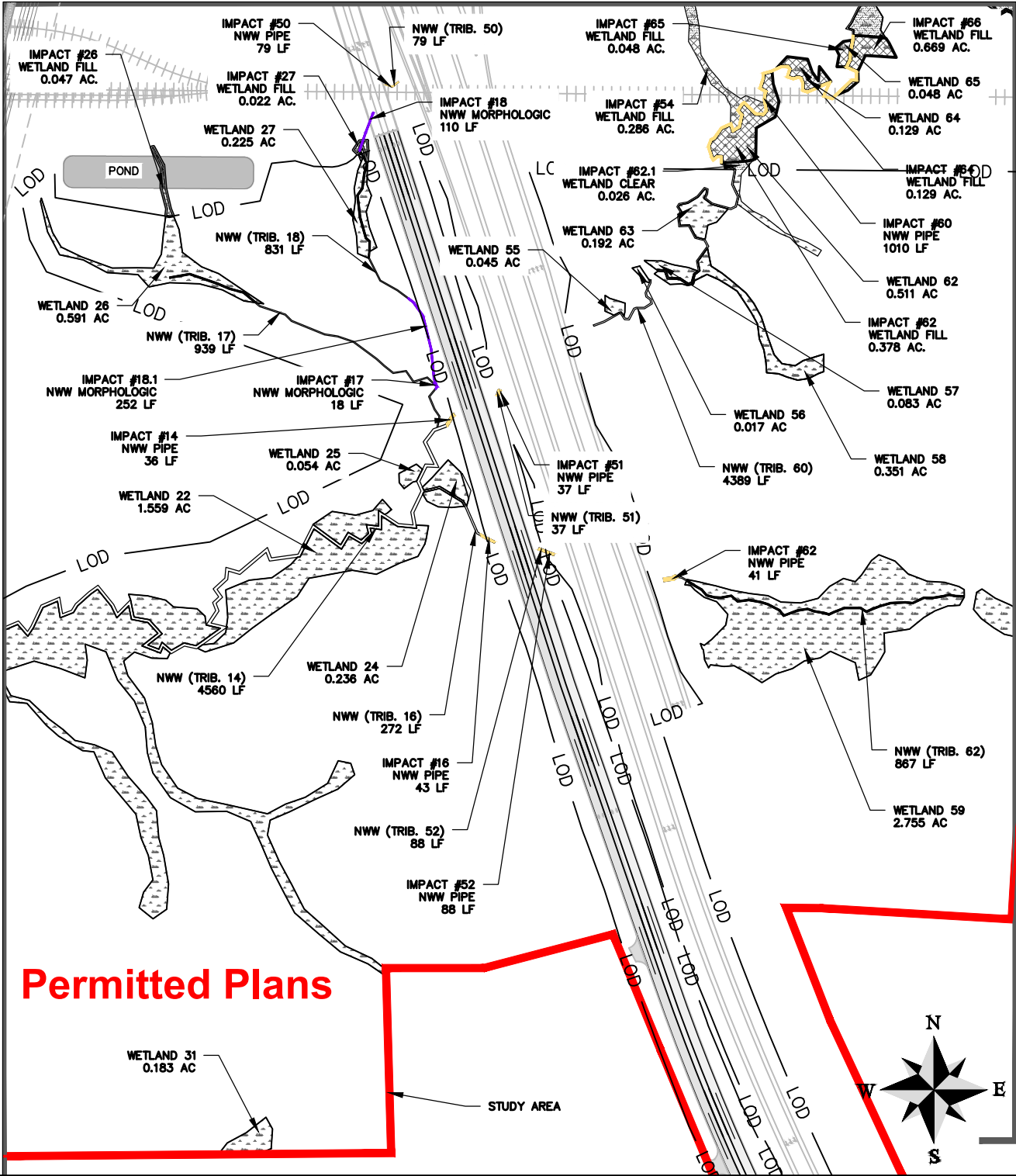
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MATCH LINE - SEE SHEET NO. 1.14

MATCH LINE - SEE SHEET NO. 1.18

MATCH LINE - SEE SHEET NO. 1.20



PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:  
RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

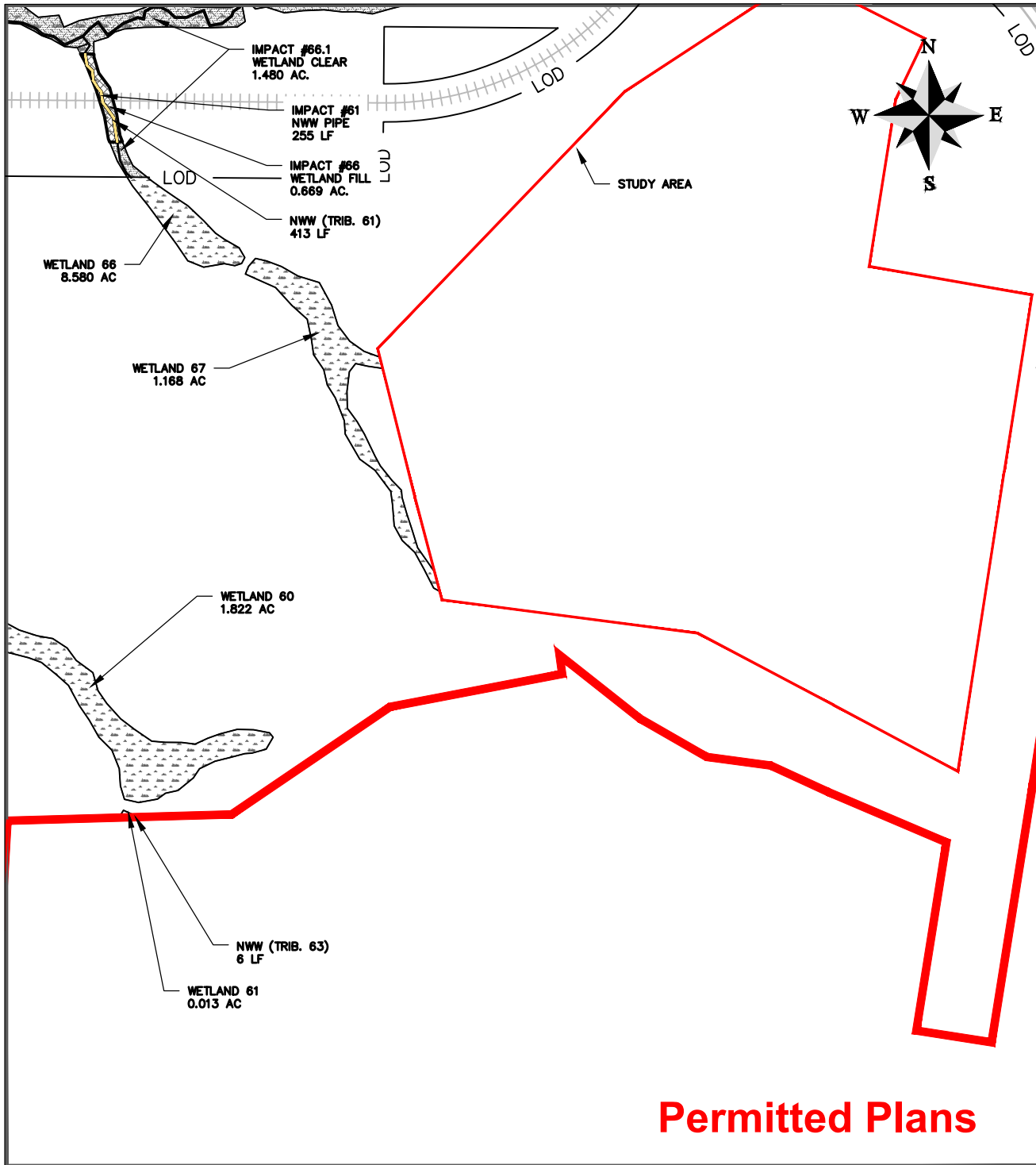
SHEET: 1.19

SCALE: 1" = 400'



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MATCH LINE - SEE SHEET NO. 1.15



### Permitted Plans

MATCH LINE - SEE SHEET NO. 1.20

#### PROJECT CONNECT - PERMIT DRAWINGS

#### AQUATIC FEATURES IMPACTS

CLIENT:  
RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

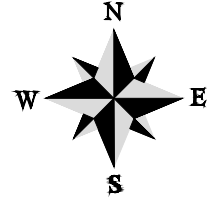
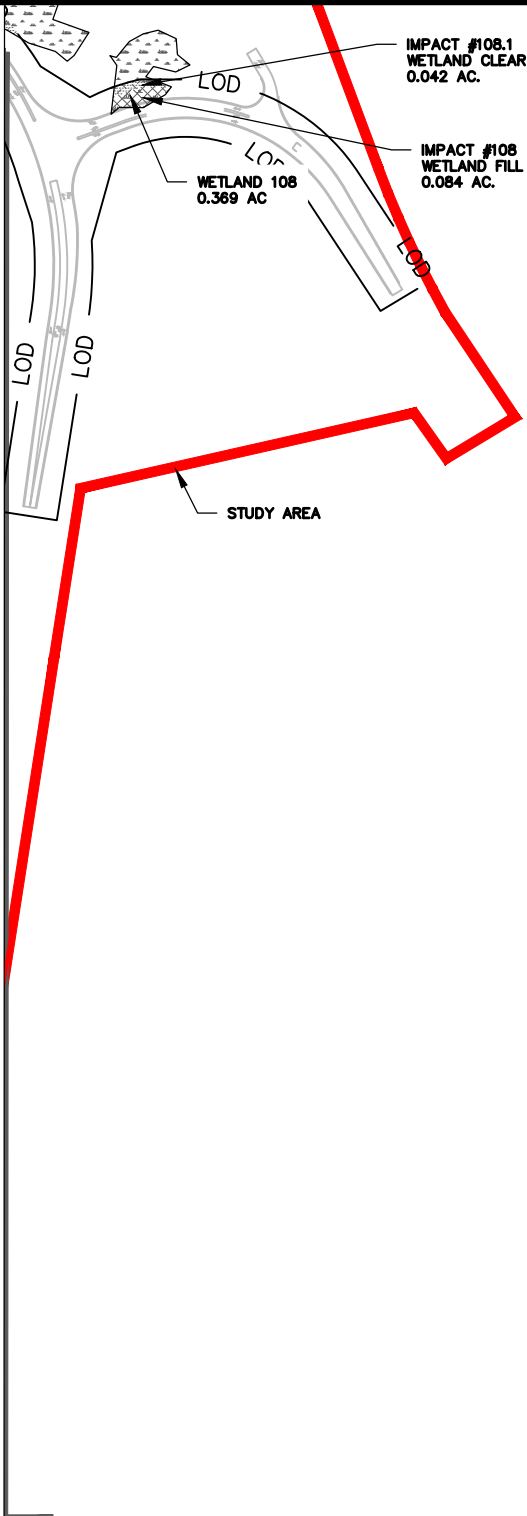
SHEET: 1.20

SCALE: 1" = 400'



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MATCH LINE - SEE SHEET NO. 1.20



## Permitted Plans

### PROJECT CONNECT - PERMIT DRAWINGS

#### AQUATIC FEATURES IMPACTS

CLIENT:

**RICHLAND COUNTY AND STATE OF SC**

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

SHEET: 1.21

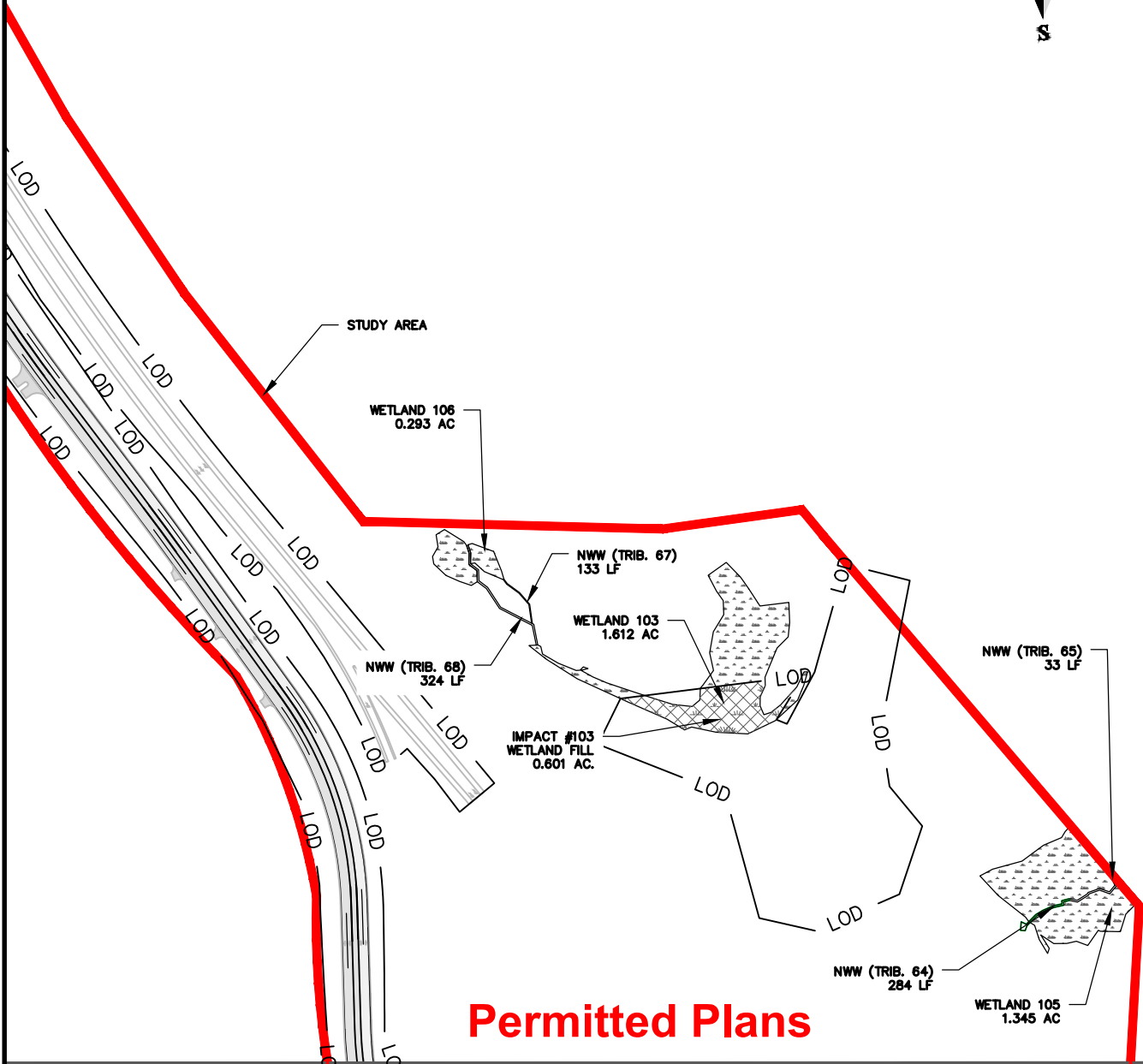
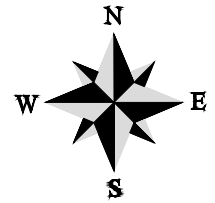
SCALE: 1" = 400'



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MATCH LINE - SEE SHEET NO. 1.20



MATCH LINE - SEE SHEET NO. 1.23

PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS

CLIENT:  
RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

SHEET: 1.22

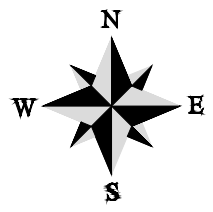
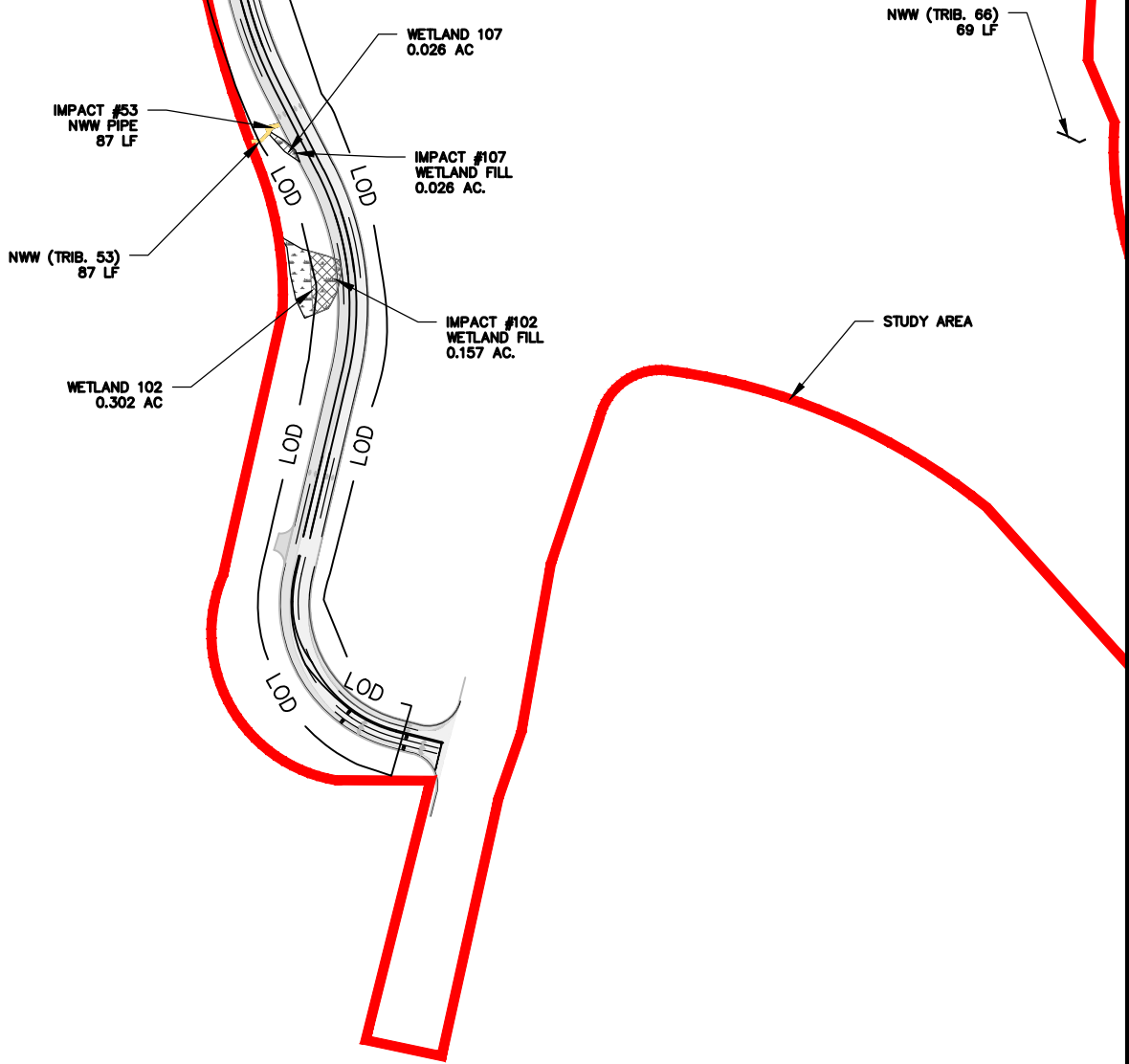
SCALE: 1" = 400'



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MATCH LINE - SEE SHEET NO. 1.22



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#### PROJECT CONNECT - PERMIT DRAWINGS

#### AQUATIC FEATURES IMPACTS

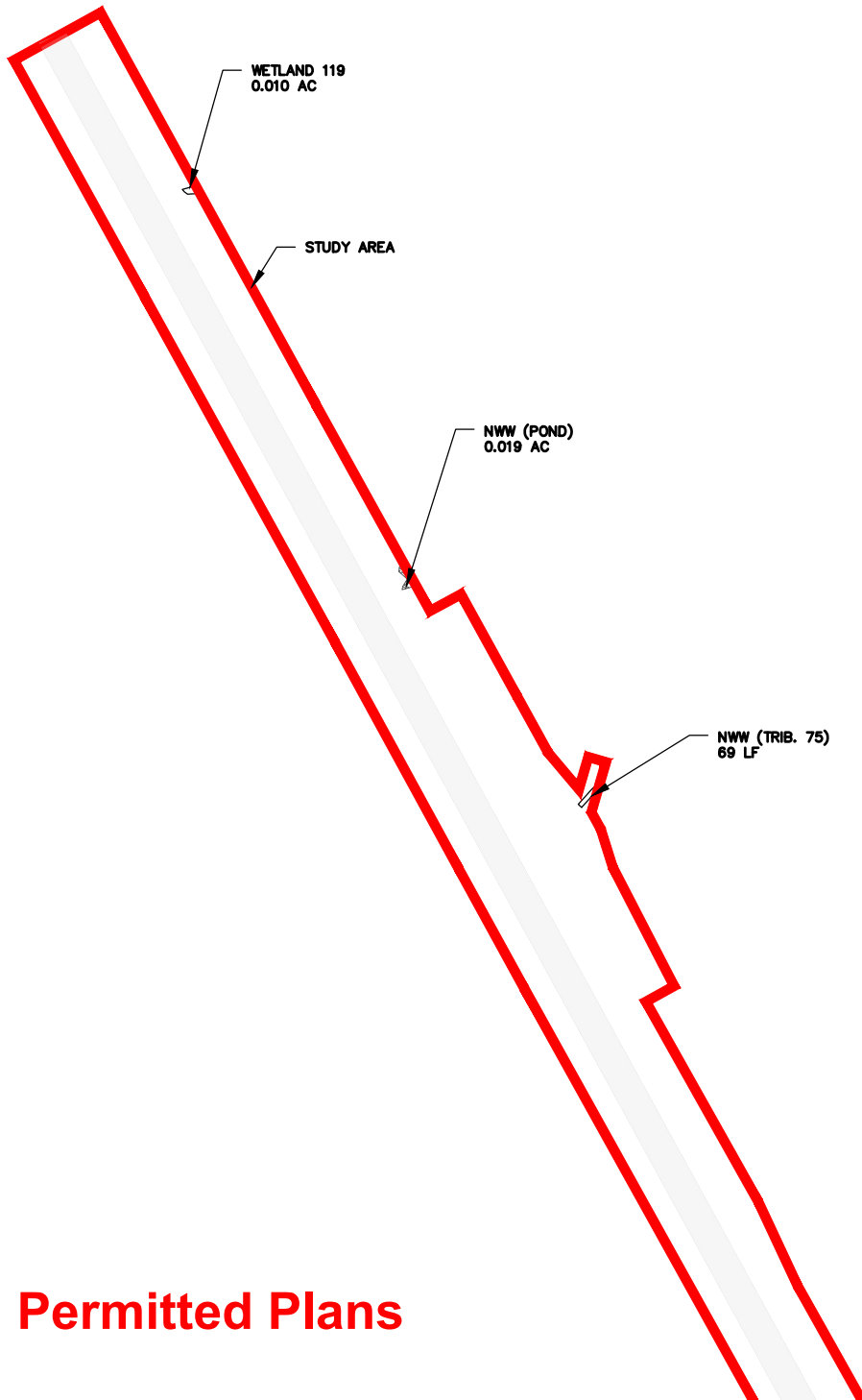
CLIENT:  
RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC	DRAWN BY: BEB	SHEET: 1.23
DATE: 10/27/23	REVIEWED BY: CW	SCALE: 1" = 400'
JOB NUMBER: J-27015.0007		

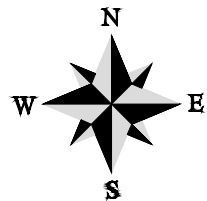


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## PROJECT CONNECT - PERMIT DRAWINGS

### AQUATIC FEATURES IMPACTS

CLIENT:

**RICHLAND COUNTY AND STATE OF SC**

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

SHEET: 1.24

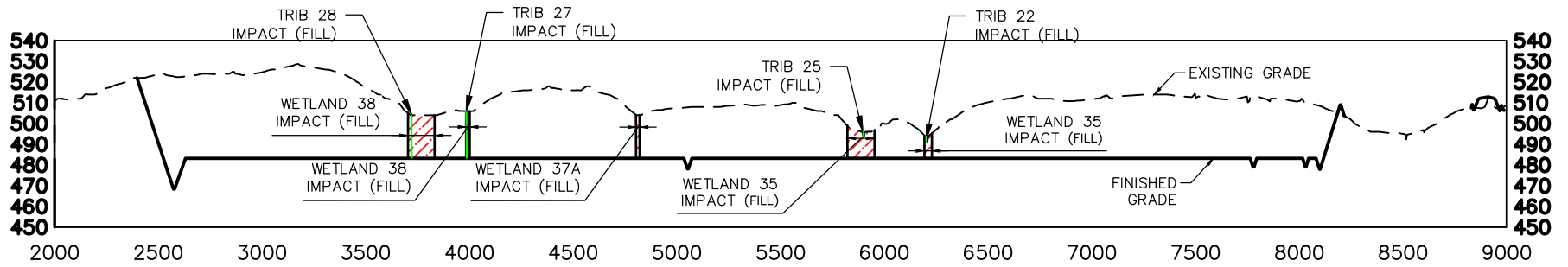
SCALE: 1" = 400'



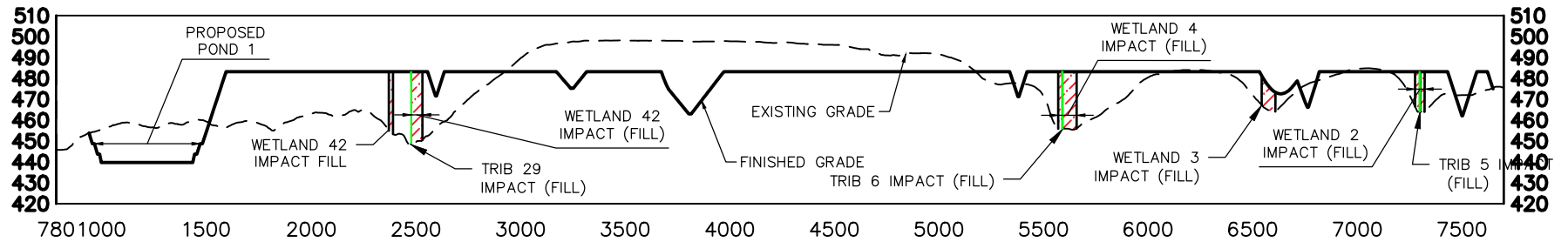
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TYPICAL DEVELOPMENT PAD SECTION (SECTION A-A')



TYPICAL DEVELOPMENT PAD SECTION (SECTION B-B')

SCALE: HOR: 1" = 400'  
VERT: 1" = 40'

### PROJECT CONNECT - WETLAND PERMIT DRAWINGS

#### AQUATIC FEATURES IMPACTS CROSS SECTIONS

CLIENT:

RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

DRAWN BY: BEB

SHEET: 1.25

JOB NUMBER: J-27015.0007

REVIEWED BY: CW

SCALE: 1" = 800'

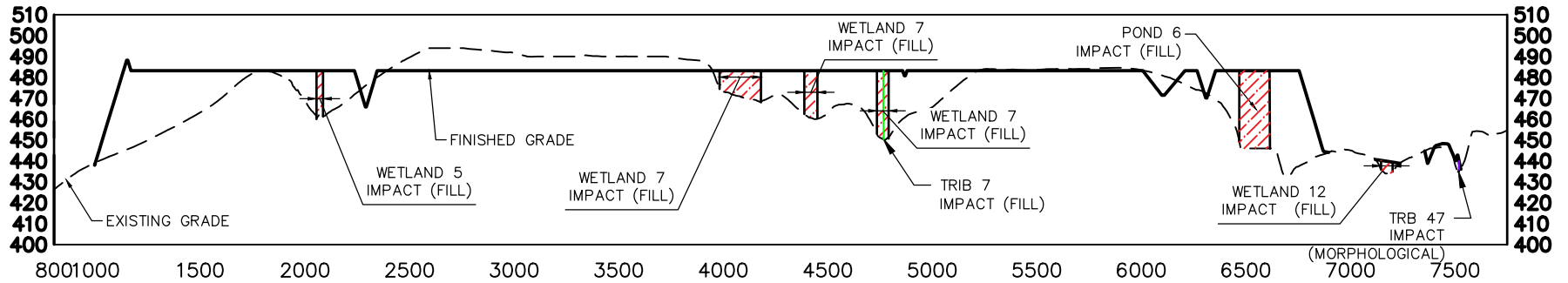


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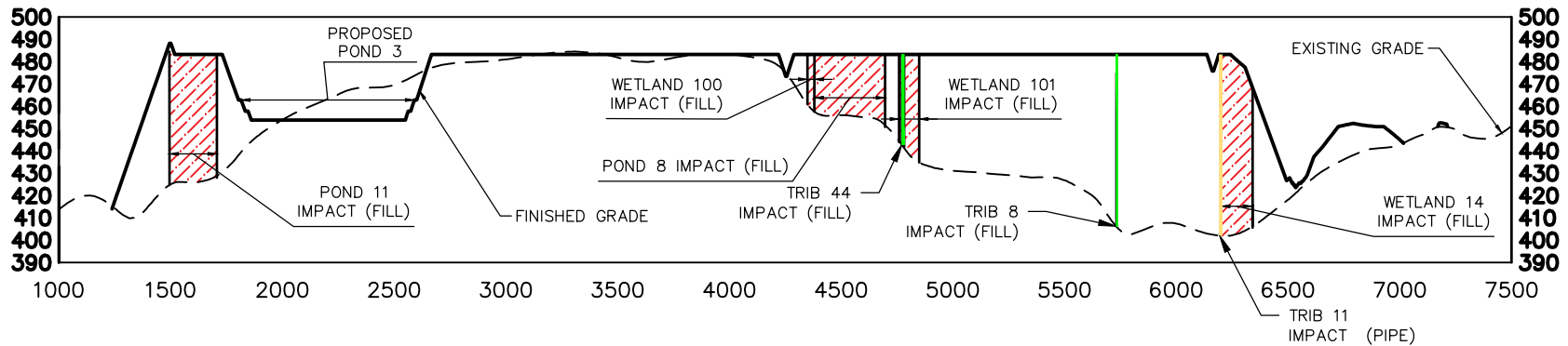
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**TYPICAL DEVELOPMENT PAD SECTION (SECTION C-C')**

SCALE: HOR: 1" = 400'  
VERT: 1" = 40'



**TYPICAL DEVELOPMENT PAD SECTION (SECTION D-D')**

SCALE: HOR: 1" = 400'  
VERT: 1" = 40'

**PROJECT CONNECT - WETLAND PERMIT DRAWINGS**

**AQUATIC FEATURES IMPACT CROSS SECTIONS**

CLIENT:

**RICHLAND COUNTY AND STATE OF SC**

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

SHEET: 1.26

SCALE: 1" = 800'

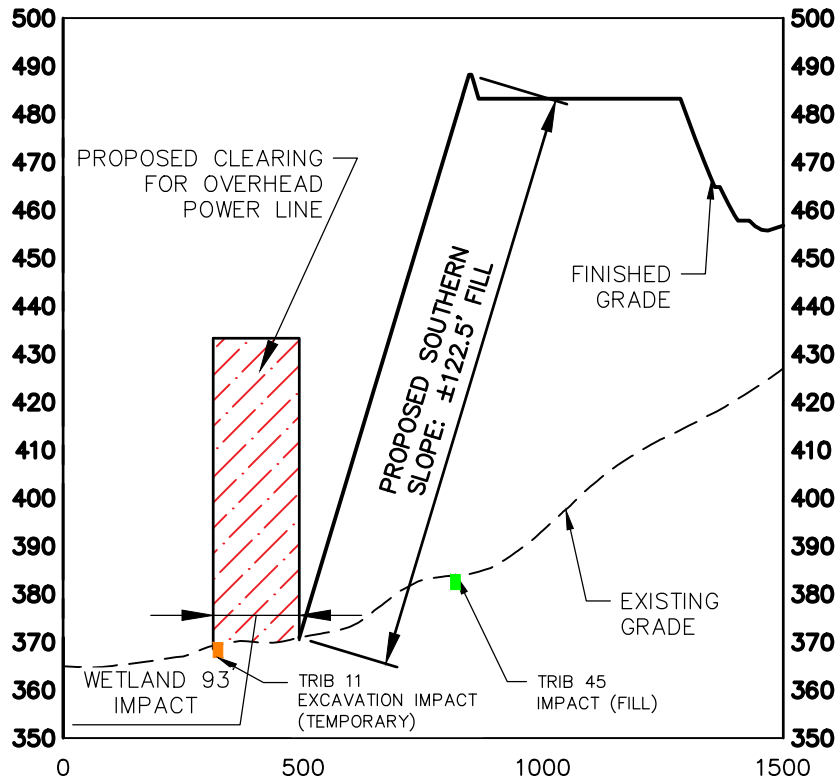


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**Permitted Plans**





## TYPICAL DEVELOPMENT PAD SECTION (SECTION E-E')

SCALE: HOR: 1" = 400'  
 VERT: 1" = 40'

**Permitted Plans**

PROJECT CONNECT - PERMIT DRAWINGS

AQUATIC FEATURES IMPACTS CROSS SECTIONS

CLIENT:

RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CW

SHEET: 1.27

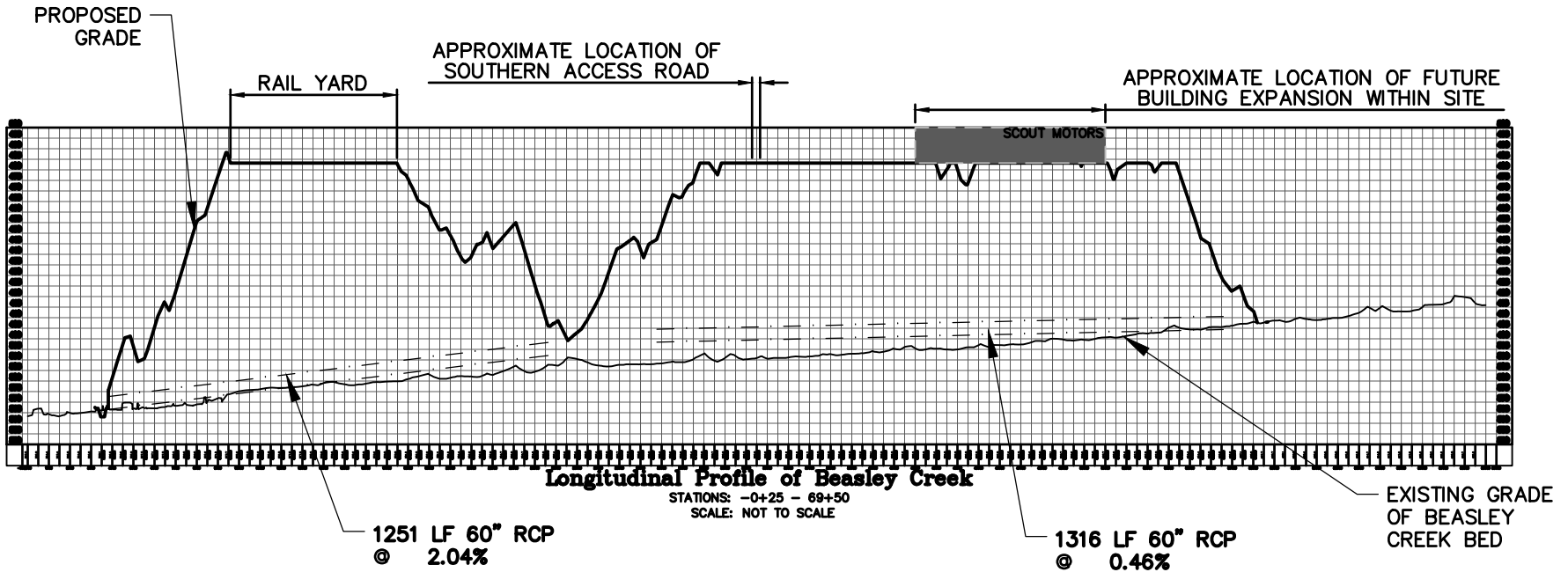
SCALE: 1" = 400'



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## Permitted Plans

NOTE: THE ALIGNMENT FOR THE BEASLEY CREEK LONGITUDINAL PROFILE FOLLOWS THE CENTERLINE OF THE STREAM CHANNEL; THEREFORE, PROPOSED GRADING AND CULVERT LENGTHS MAY APPEAR SKEWED WITH RESPECT TO THE PROFILE

### PROJECT CONNECT - WETLAND PERMIT DRAWINGS

#### LONGITUDINAL PROFILE OF BEASLEY CREEK

CLIENT:

**RICHLAND COUNTY AND STATE OF SC**

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CGW

SHEET: 1.28

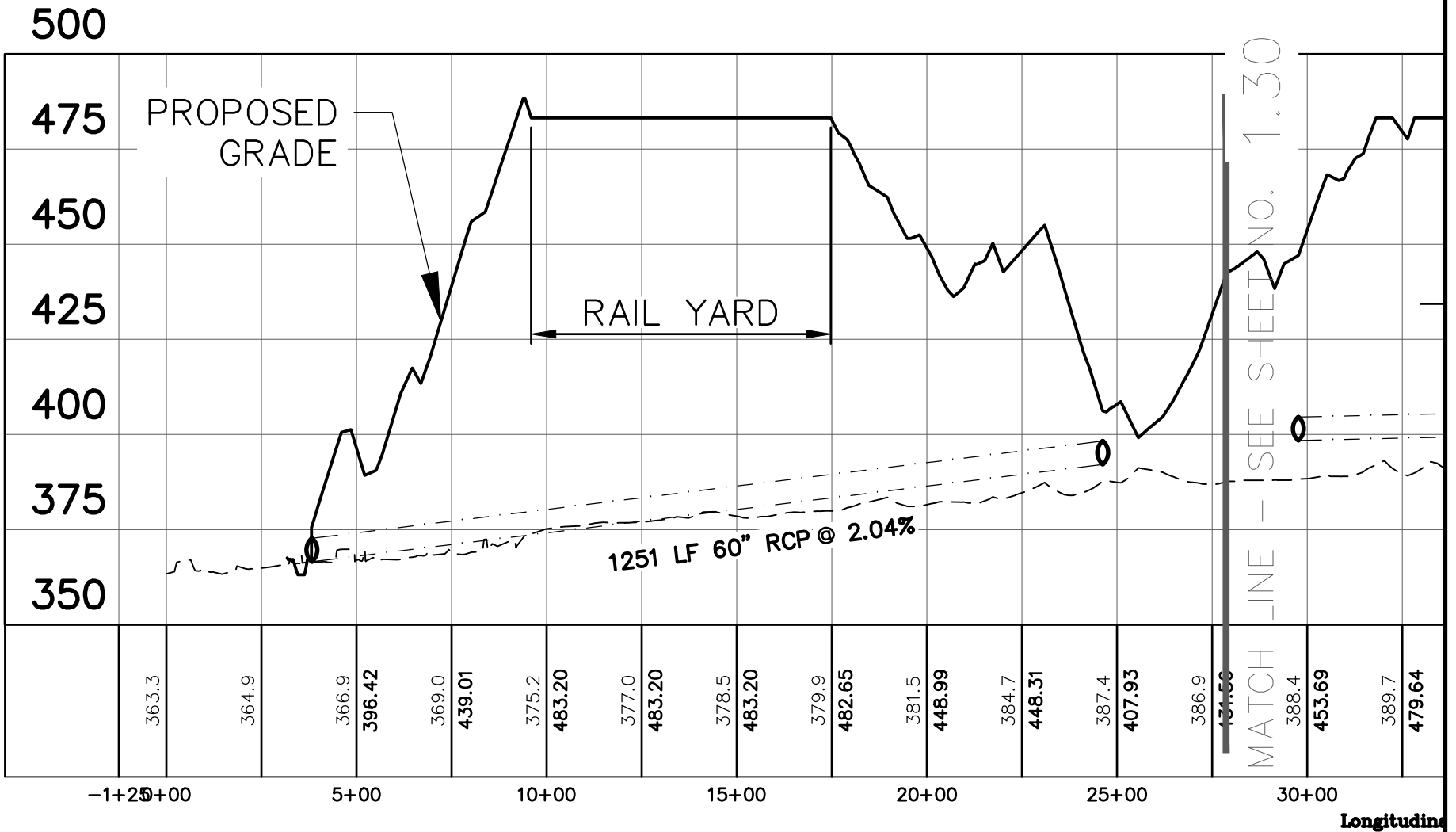
SCALE: 1" = 800'



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**PROJECT CONNECT - WETLAND PERMIT DRAWINGS**

**LONGITUDINAL PROFILE OF BEASLEY CREEK**

CLIENT:

**RICHLAND COUNTY AND STATE OF SC**

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CGW

SHEET: 1.29

SCALE: 1" = 40'

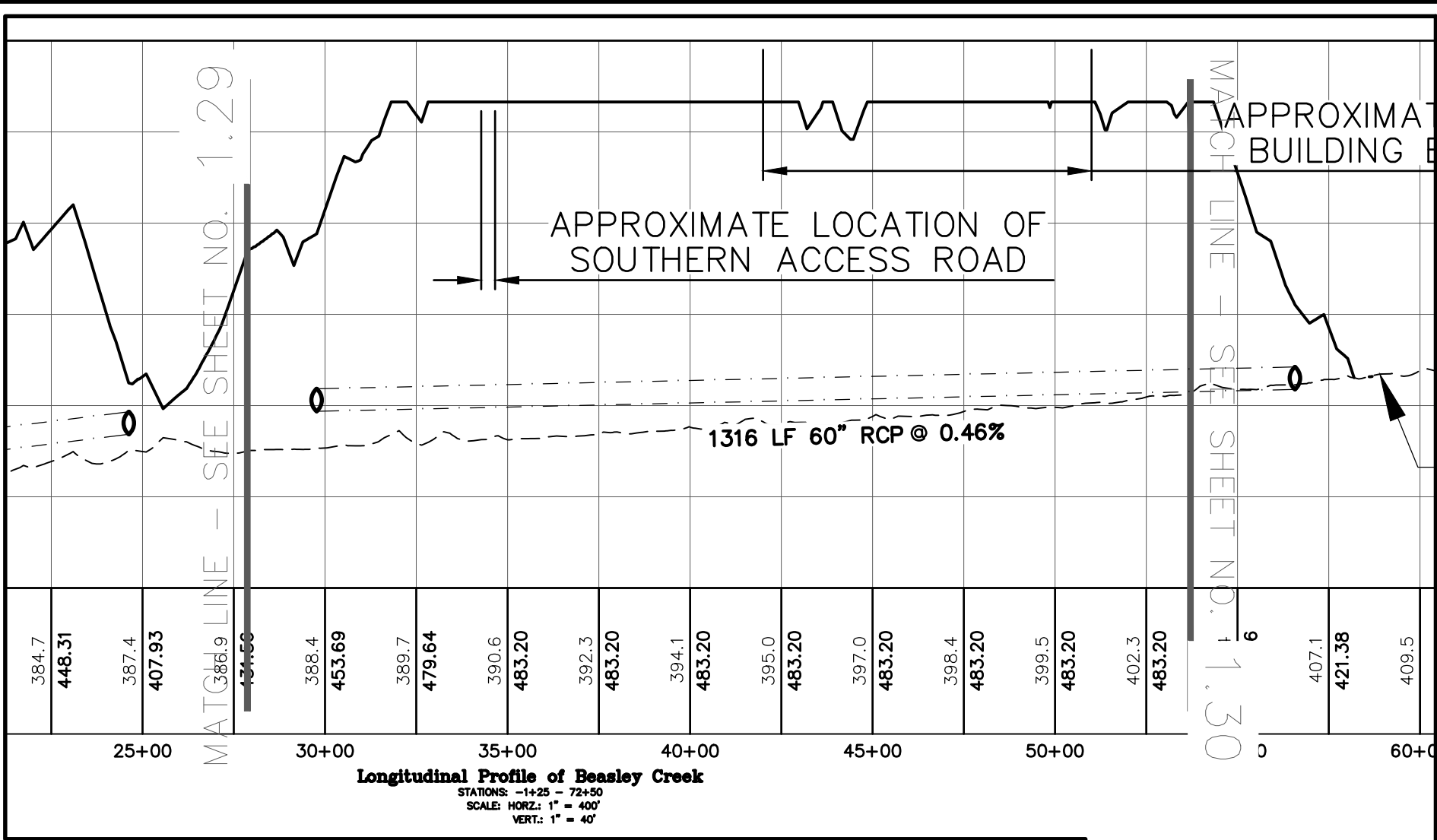


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**Permitted Plans**

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PROJECT CONNECT - WETLAND PERMIT DRAWINGS

LONGITUDINAL PROFILE OF BEASLEY CREEK

CLIENT:

RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CGW

SHEET: 1.30

SCALE: 1" = 400'

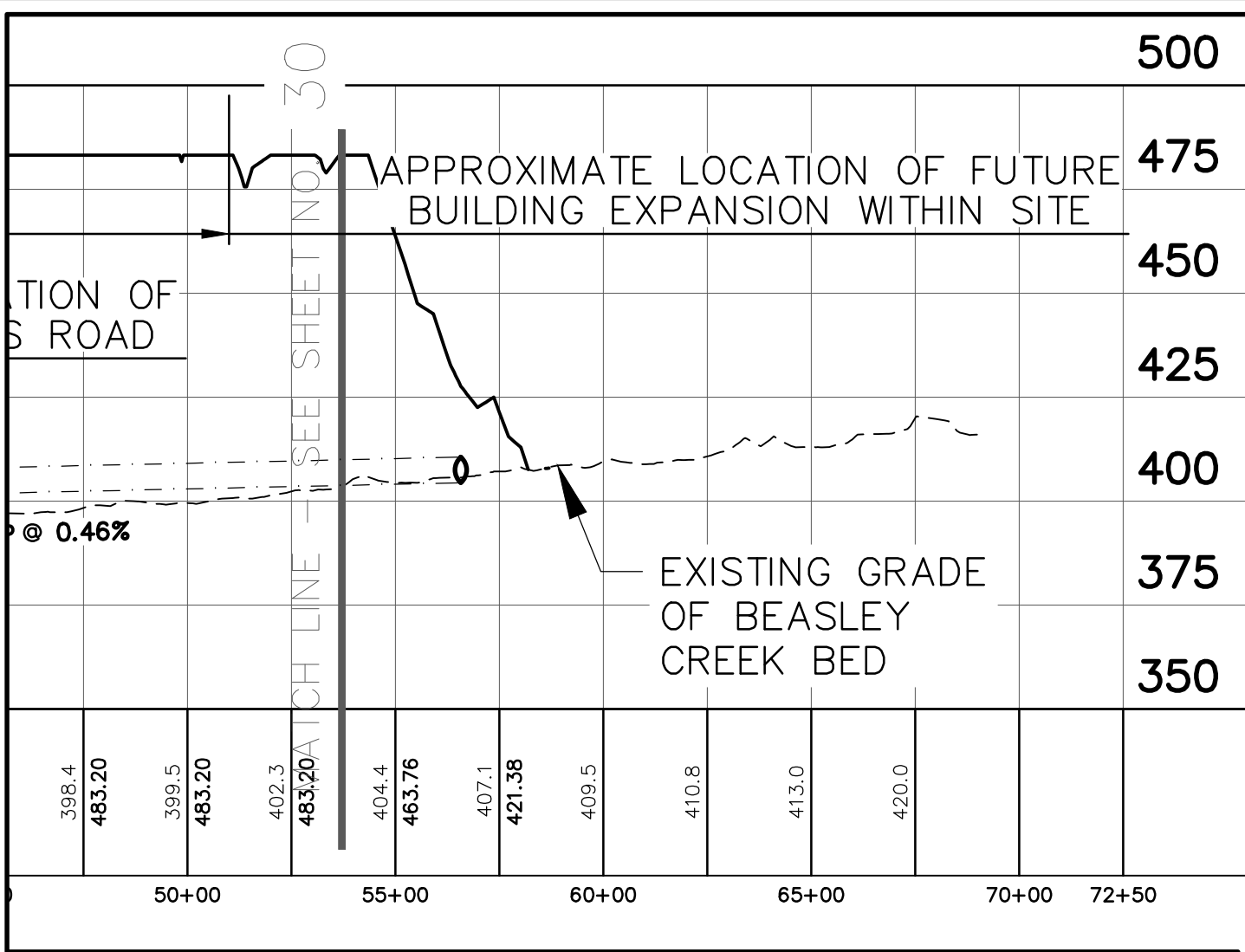


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z:\27015\27015.0007\ENGINEERING\DRAWINGS\EXHIBITS\WETLANDS\27015.0007 - WETLANDS IMPACT - BEASLEY CREEK 2.DWG - Oct 30, 2023 - 12:54 PM



PROJECT CONNECT - WETLAND PERMIT DRAWINGS

LONGITUDINAL PROFILE OF BEASLEY CREEK

CLIENT:

RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

DRAWN BY: BEB

SHEET: 1.31

JOB NUMBER: J-27015.0007

REVIEWED BY: CGW

SCALE: 1" = 400'

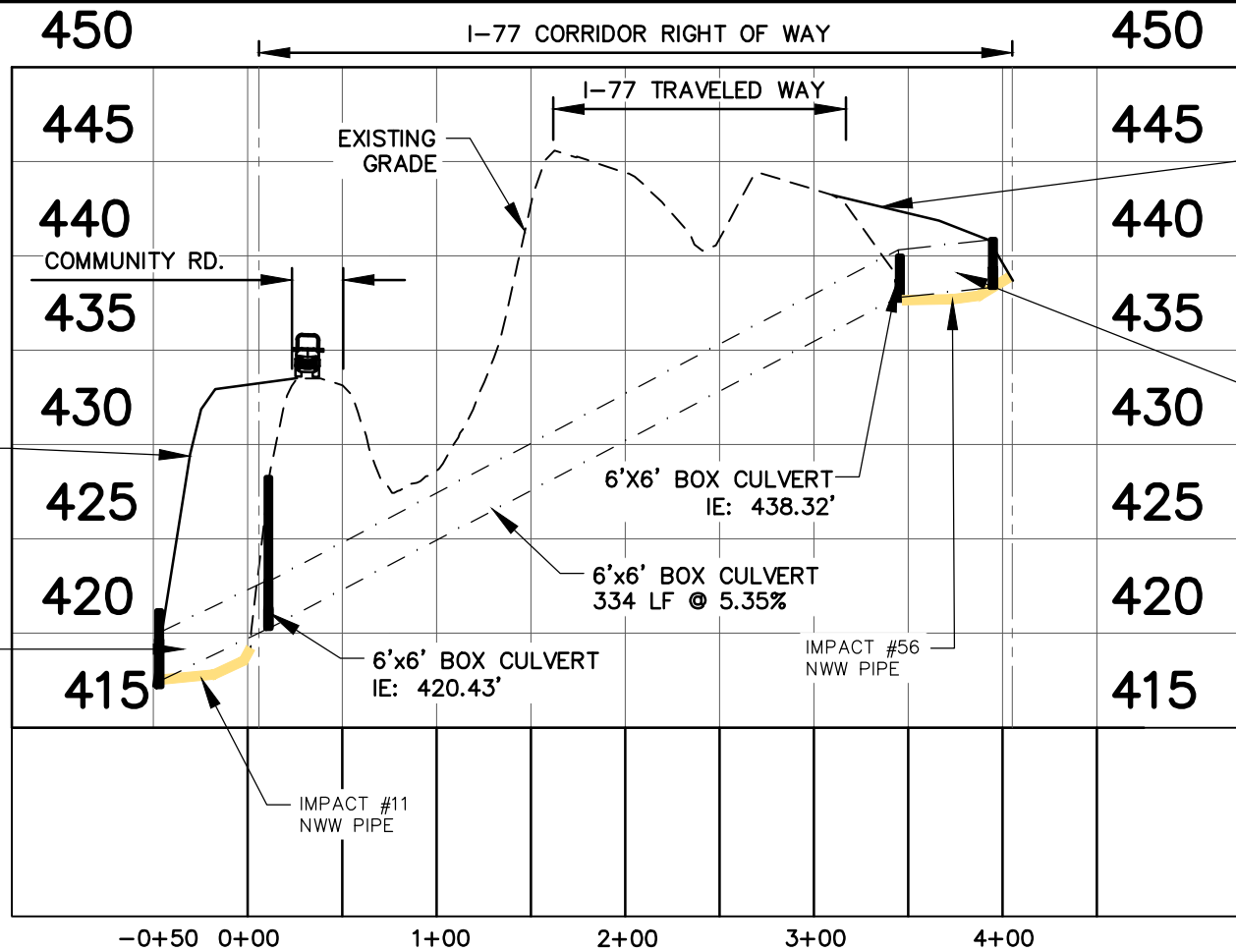


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z:\27015\27015.0007\ENGINEERING\DRAWINGS\EXHIBITS\WETLANDS\27015.0007 - WETLANDS IMPACT EXHIBIT - I-77 CULVERT.DWG - Oct 30, 2023 - 9:59 AM



**1-77 Existing Box Culvert Crossing**  
STATIONS: -0+50 - 4+00  
NOT TO SCALE

PROJECT CONNECT - WETLAND PERMIT DRAWINGS

I-77 EXISTING BOX CULVERT CROSSING

CLIENT:  
RICHLAND COUNTY AND STATE OF SC  
LOCATION: BLYTHEWOOD, SC  
DATE: 10/27/23  
JOB NUMBER: J-27015.0007

DRAWN BY: BEB  
REVIEWED BY: CGW

SHEET: 1.32  
SCALE: 1" = 100'

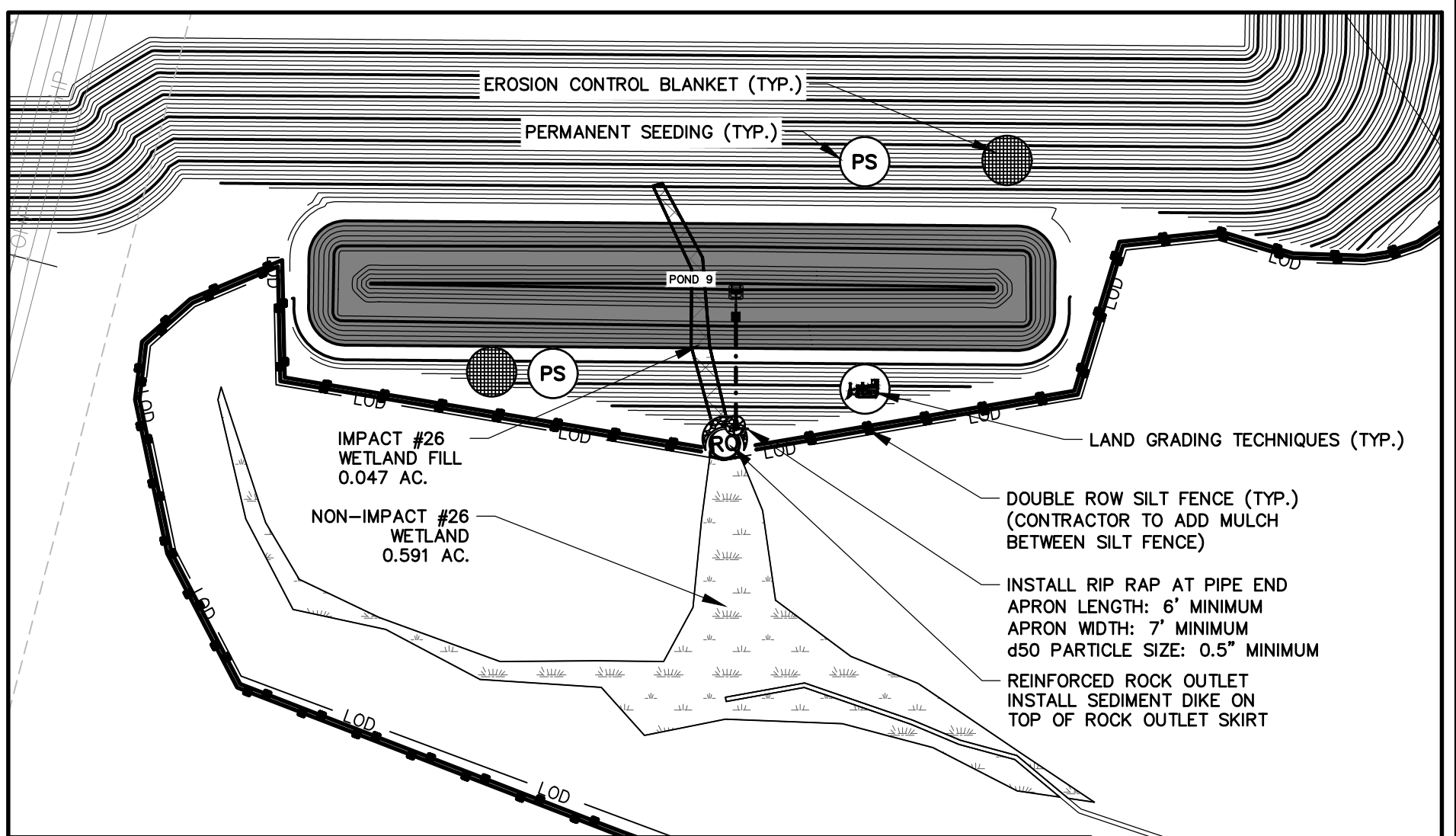


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z:\27015\27015.0007\ENGINEERING\DRAWINGS\EXHIBITS\WETLANDS\27015.0007 - WETLANDS IMPACT - STABILIZATION.DWG - Oct. 30, 2023 - 1:00 PM



### PROJECT CONNECT - WETLAND PERMIT DRAWINGS

#### TYPICAL WETLAND PROTECTION PLAN

CLIENT:

**RICHLAND COUNTY AND STATE OF SC**

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CGW

SHEET: 1.33

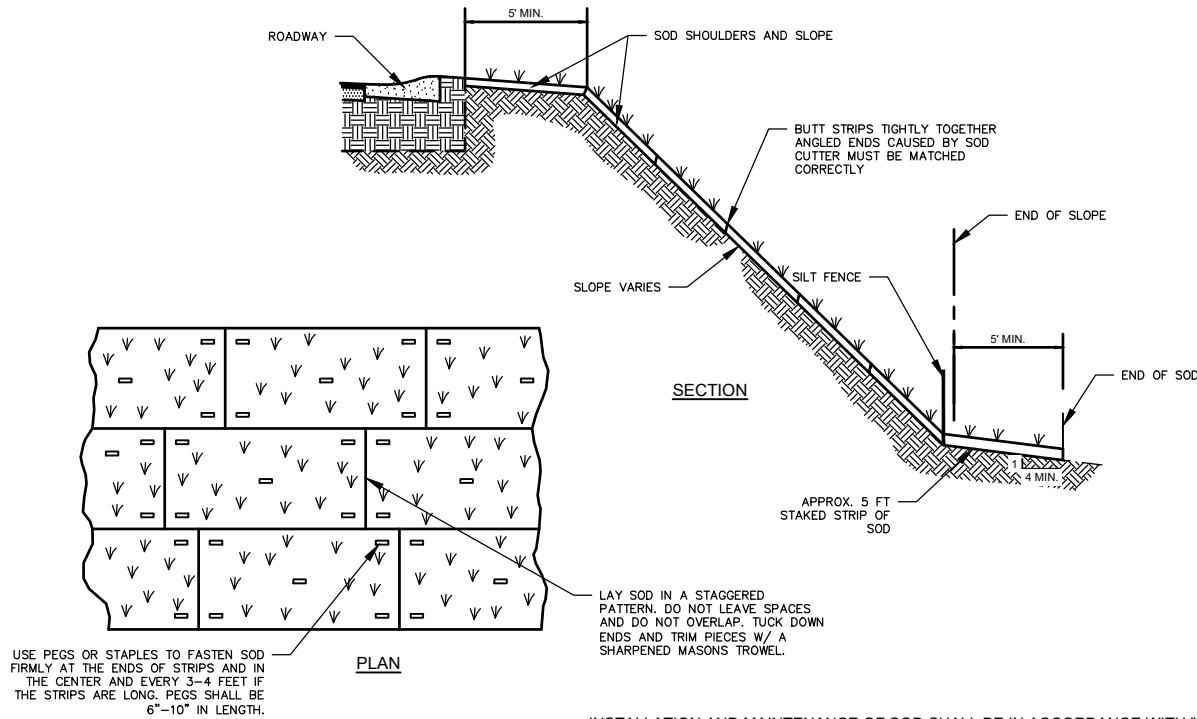
SCALE: 1" = 100'



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**Permitted Plans**



USE PEGS OR STAPLES TO FASTEN SOD FIRMLY AT THE ENDS OF STRIPS AND IN THE CENTER AND EVERY 3-4 FEET IF THE STRIPS ARE LONG. PEGS SHALL BE 6"-10" IN LENGTH.



**SLOPED SODDING DETAIL**

NOT TO SCALE

INSTALLATION AND MAINTENANCE OF SOD SHALL BE IN ACCORDANCE WITH "EROSION AND SEDIMENT CONTROL PRACTICES FOR DEVELOPING AREAS" BY THE SOUTH CAROLINA RESOURCES CONSERVATION COMMISSION.

THE FIRST ROW OF SOD SHOULD BE LAID IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO AND BUTTING TIGHTLY AGAINST EACH OTHER. JOINTS SHOULD BE STAGGERED TO PROMOTE MORE UNIFORM GROWTH AND STRENGTH AND TO REDUCE THE CHANCE OF WASHOUTS UNDERNEATH THE SOD. CARE SHOULD BE EXERCISED TO INSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED TIGHT IN ORDER TO PREVENT VOIDS WHICH WOULD CAUSE DRYING OF THE ROOTS. SMALL GAPS OR VOIDS REMAINING AFTER THE SOIL IS LAID SHOULD BE FILLED WITH TOPSOIL.

PROVIDE STRONGLY ROOTED ST AUGUSTINE SOD, NOT LESS THAN 2 YEARS OLD AND FREE OF WEEDS AND UNDESIRABLE NATIVE GRASSES. PROVIDE ONLY SOD CERTIFIED BY THE CROP PEST COMMISSION CAPABLE OF GROWTH WHEN PLANTED (VIALBE NOT DORMANT), AND IN STRIPS OF NOT MORE THAN 18 INCHES WIDE AND 72 INCHES LONG.

PROJECT CONNECT - WETLAND PERMIT DRAWINGS

TYPICAL WETLANDS PROTECTION DETAILS

CLIENT:

RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CGW

SHEET: 1.34

SCALE: NTS

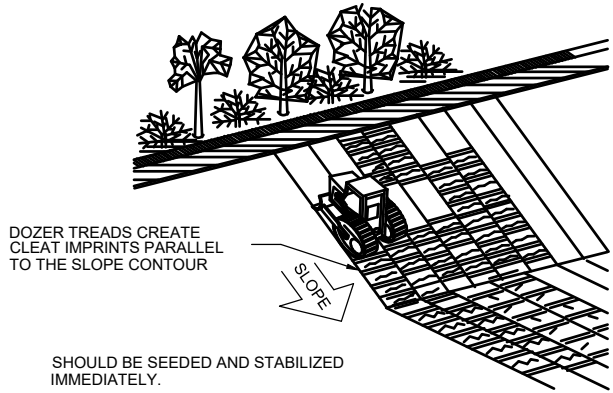


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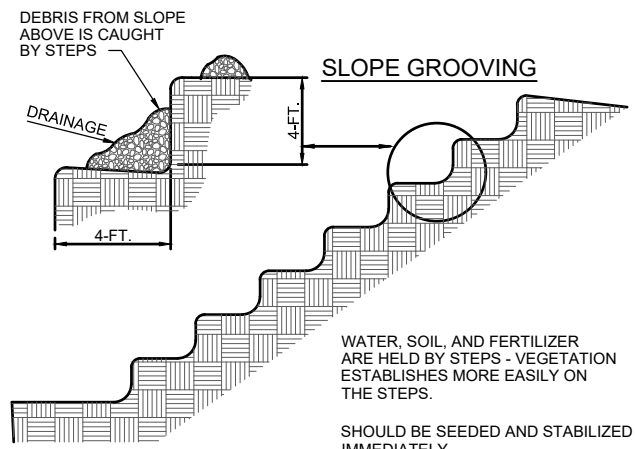
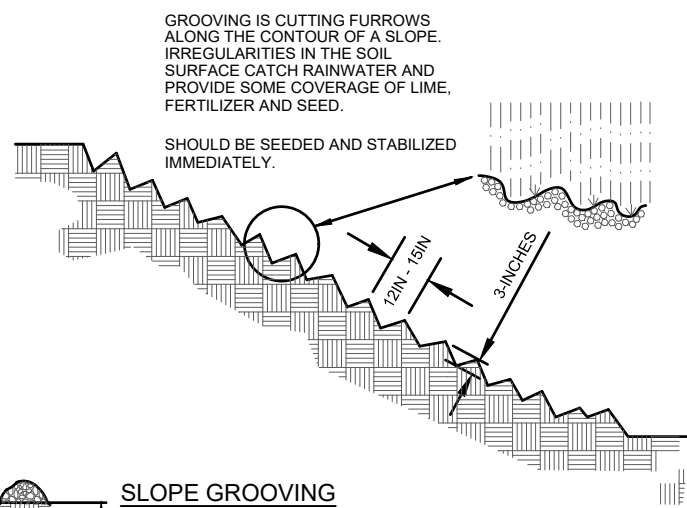
**Permitted Plans**





SHOULD BE SEEDED AND STABILIZED IMMEDIATELY.

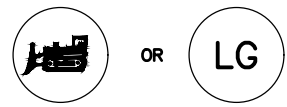
TRACKING



WATER, SOIL, AND FERTILIZER ARE HELD BY STEPS - VEGETATION ESTABLISHES MORE EASILY ON THE STEPS.

SHOULD BE SEEDED AND STABILIZED IMMEDIATELY.

STAIR-STEP GRADING



LAND GRADING TECHNIQUES

NOT TO SCALE

PROJECT CONNECT - WETLAND PERMIT DRAWINGS

TYPICAL WETLAND PROTECTION PLAN

CLIENT:  
RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC  
 DATE: 10/27/23  
 JOB NUMBER: J-27015.0007

DRAWN BY: BEB  
 REVIEWED BY: CGW

SHEET: 1.35  
 SCALE: NTS

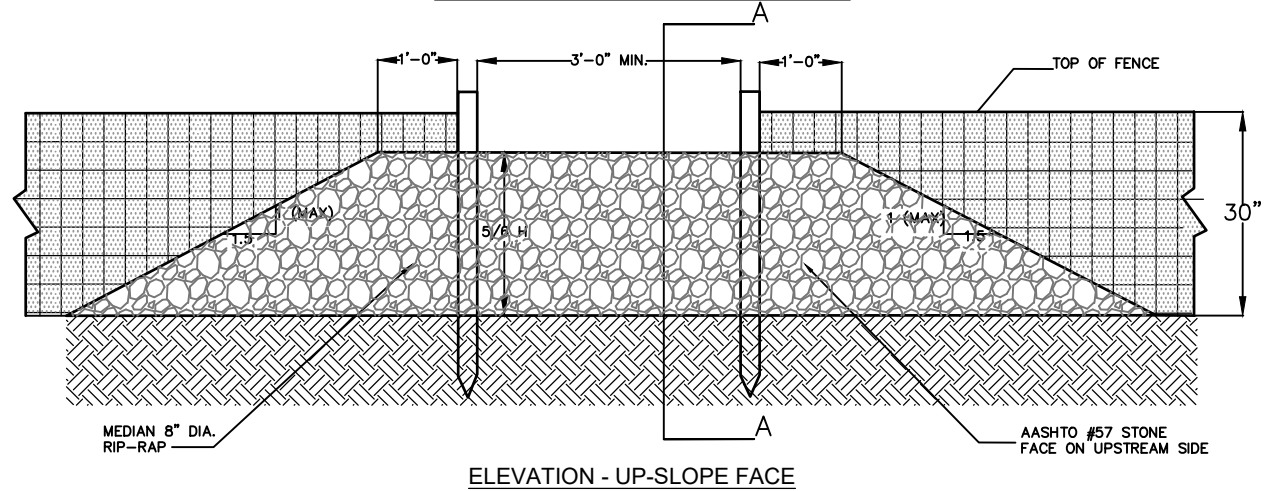


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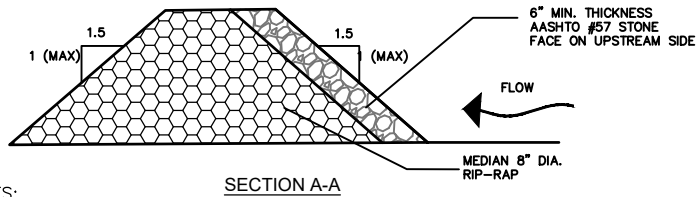
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**Permitted Plans**

### SILT FENCE ROCK OUTLET



ELEVATION - UP-SLOPE FACE



### SILT FENCE ROCK OUTLET

NOT TO SCALE

NOTES:

1. WASHED STONE (#57) TO BE REMOVED AND REPLACED ONCE IT BECOMES CLOGGED WITH SEDIMENT.
2. SEDIMENT TO BE REMOVED WHEN ACCUMULATIONS REACH 1/3 HEIGHT OF SILT FENCE
3. THE KEY TO FUNCTIONAL ROCK OUTLETS IS WEEKLY INSPECTIONS, ROUTINE MAINTENANCE, AND REGULAR SEDIMENT REMOVAL.

#### PROJECT CONNECT - WETLAND PERMIT DRAWINGS

#### TYPICAL WETLAND PROTECTION PLAN

CLIENT:

**RICHLAND COUNTY AND STATE OF SC**

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

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SCALE: NTS



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**Permitted Plans**

**WHEN AND WHERE TO USE IT:**  
SILT FENCE IS APPLICABLE IN AREAS:

WHERE THE MAXIMUM SHEET OR OVERLAND FLOW PATH LENGTH TO THE FENCE IS 100-FEET.  
WHERE THE MAXIMUM SLOPE STEEPNESS (NORMAL [PERPENDICULAR] TO FENCE LINE) IS 2H:1V.  
THAT DO NOT RECEIVE CONCENTRATED FLOWS GREATER THAN 0.5 CFS.

**DO NOT** PLACE SILT FENCE ACROSS CHANNELS OR USE IT AS A VELOCITY CONTROL BMP.

**MATERIALS:**

**STEEL POSTS**

USE 48-INCH LONG STEEL POSTS THAT MEET THE FOLLOWING MINIMUM PHYSICAL REQUIREMENTS:  
COMPOSED OF HIGH STRENGTH STEEL WITH MINIMUM YIELD STRENGTH OF 50,000 PSI.  
HAVE A STANDARD "T" SECTION WITH A NOMINAL FACE WIDTH OF 1.38-INCHES AND NOMINAL "T" LENGTH OF 1.48-INCHES.  
WEIGH 1.25 POUNDS PER FOOT (± 8%).  
HAVE A SOIL STABILIZATION PLATE WITH A MINIMUM CROSS SECTION AREA OF 17-SQUARE INCHES ATTACHED TO THE STEEL POSTS.  
PAINTED WITH A WATER BASED BAKED ENAMEL PAINT.

USE STEEL POSTS WITH A MINIMUM LENGTH OF 4-FEET, WEIGHING 1.25 POUNDS PER LINEAR FOOT (± 8%) WITH PROJECTIONS TO AID IN FASTENING THE FABRIC. EXCEPT WHEN HEAVY CLAY SOILS ARE PRESENT ON SITE, STEEL POSTS WILL HAVE A METAL SOIL STABILIZATION PLATE WELDED NEAR THE BOTTOM SUCH THAT WHEN THE POST IS DRIVEN TO THE PROPER DEPTH, THE PLATE WILL BE BELOW THE GROUND LEVEL FOR ADDED STABILITY.  
THE SOIL PLATES SHOULD HAVE THE FOLLOWING CHARACTERISTICS:  
BE COMPOSED OF MINIMUM 15 GAUGE STEEL.  
HAVE A MINIMUM CROSS SECTION AREA OF 17-SQUARE INCHES.

**GEOTEXTILE FILTER FABRIC:**

**FILTER FABRIC IS:**

COMPOSED OF FIBERS CONSISTING OF LONG CHAIN SYNTHETIC POLYMERS COMPOSED OF AT LEAST 85% BY WEIGHT OF POLYOLEFINS, POLYESTERS, OR POLYAMIDES.  
FORMED INTO A NETWORK SUCH THAT THE FILAMENTS OR YARNS RETAIN DIMENSIONAL STABILITY RELATIVE TO EACH OTHER.  
FREE OF ANY TREATMENT OR COATING WHICH MIGHT ADVERSELY ALTER ITS PHYSICAL PROPERTIES AFTER INSTALLATION.  
FREE OF DEFECTS OR FLAWS THAT SIGNIFICANTLY AFFECT ITS PHYSICAL AND/OR FILTERING PROPERTIES.  
CUT TO A MINIMUM WIDTH OF 36 INCHES.

USE ONLY FABRIC APPEARING ON SCDOT APPROVAL SHEET #34 MEETING THE REQUIREMENTS OF THE MOST CURRENT EDITION OF THE SCDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

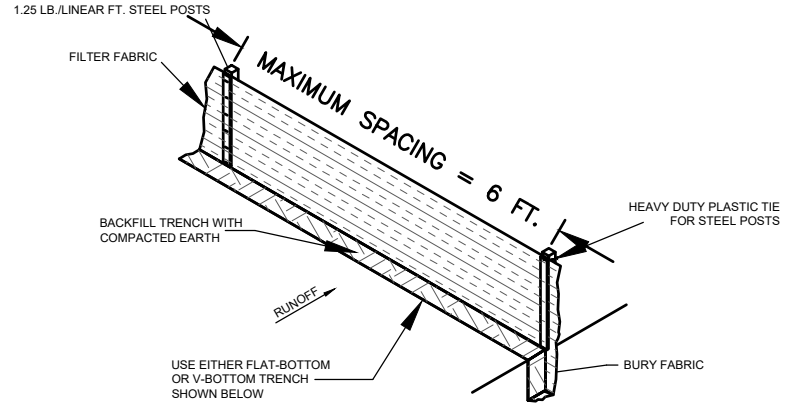
**INSTALLATION:**

EXCAVATE A TRENCH APPROXIMATELY 6-INCHES WIDE AND 6-INCHES DEEP WHEN PLACING FABRIC BY HAND. PLACE 12-INCHES OF GEOTEXTILE FABRIC INTO THE 6-INCH DEEP TRENCH, EXTENDING THE REMAINING 6-INCHES TOWARDS THE UPSLOPE SIDE OF THE TRENCH. BACKFILL THE TRENCH WITH SOIL OR GRAVEL AND COMPACT. BURY 12-INCHES OF FABRIC INTO THE GROUND WHEN PNEUMATICALLY INSTALLING SILT FENCE WITH A SLICING METHOD. PURCHASE FABRIC IN CONTINUOUS ROLLS AND CUT TO THE LENGTH OF THE BARRIER TO AVOID JOINTS. WHEN JOINTS ARE NECESSARY, WRAPPED THE FABRIC TOGETHER AT A SUPPORT POST WITH BOTH ENDS FASTENED TO THE POST, WITH A 6-INCH MINIMUM OVERLAP. INSTALL POSTS TO A MINIMUM DEPTH OF 24-INCHES. INSTALL POSTS A MINIMUM OF 1- TO 2- INCHES ABOVE THE FABRIC, WITH NO MORE THAN 3- FEET OF THE POST ABOVE THE GROUND. SPACE POSTS TO MAXIMUM 6- FEET CENTERS. ATTACH FABRIC TO WOOD POSTS USING STAPLES MADE OF HEAVY-DUTY WIRE AT LEAST 1-1/2-INCH LONG, SPACED A MAXIMUM OF 6-INCHES APART. STAPLE A 2-INCH WIDE LATHE OVER THE FILTER FABRIC TO SECURELY FASTEN IT TO THE UPSLOPE SIDE OF WOODEN POSTS. ATTACH FABRIC TO THE STEEL POSTS USING HEAVY-DUTY PLASTIC TIES THAT ARE EVENLY SPACED AND PLACED IN A MANNER TO PREVENT SAGGING OR TEARING OF THE FABRIC. IN CALL CASES, TIES SHOULD BE AFFIXED IN NO LESS THAN 4 PLACES. INSTALL THE FABRIC A MINIMUM OF 24-INCHES ABOVE THE GROUND. WHEN NECESSARY, THE HEIGHT OF THE FENCE ABOVE GROUND MAY BE GREATER THAN 24-INCHES. IN TIDAL AREAS, EXTRA SILT FENCE HEIGHT MAY BE REQUIRED. THE POST HEIGHT WILL BE TWICE THE EXPOSED POST HEIGHT. POST SPACING WILL REMAIN THE SAME AND EXTRA HEIGHT FABRIC WILL BE 4-, 5-, OR 6- FEET TALL. LOCATE SILT FENCE CHECKS EVERY 100 FEET MAXIMUM AND AT LOW POINTS. INSTALL THE FENCE PERPENDICULAR TO THE DIRECTION OF FLOW AND PLACE THE FENCE THE PROPER DISTANCE FROM THE TOE OF STEEP SLOPES TO PROVIDE SEDIMENT STORAGE AND ACCESS FOR MAINTENANCE AND CLEANOUT.

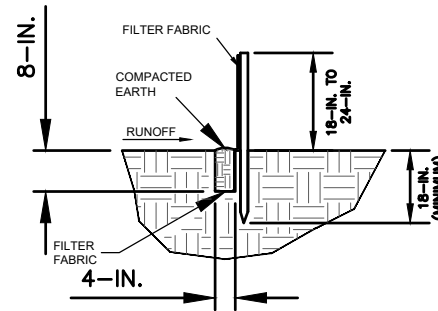
**INSPECTION AND MAINTENANCE:**

CHECK FOR SEDIMENT BUILDUP AND FENCE INTEGRITY. CHECK WHERE RUNOFF HAS ERODED A CHANNEL BENEATH THE FENCE, OR WHERE THE FENCE HAS SAGGED OR COLLAPSED BY FENCE OVERTOPPING. IF THE FENCE FABRIC TEARS, BEGINS TO DECOMPOSE, OR IN ANY WAY BECOMES INEFFECTIVE, REPLACE THE SECTION OF FENCE IMMEDIATELY. REMOVE SEDIMENT ACCUMULATED ALONG THE FENCE WHEN IT REACHES 1/3 THE HEIGHT OF THE FENCE, ESPECIALLY IF HEAVY RAINS ARE EXPECTED. REMOVE TRAPPED SEDIMENT FROM THE SITE OR STABILIZE IT ON SITE. REMOVE SILT FENCE WITHIN 30 DAYS AFTER FINAL STABILIZATION IS ACHIEVED OR

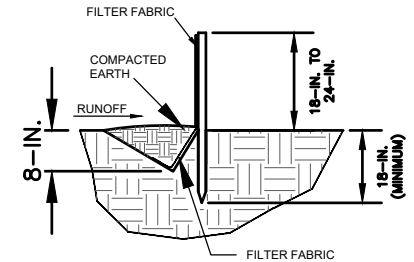
AFTER TEMPORARY BEST MANAGEMENT PRACTICES (BMPs) ARE NO LONGER NEEDED, PERMANENTLY STABILIZE DISTURBED AREAS RESULTING FROM FENCE REMOVAL.



**SILT FENCE INSTALLATION**



**FLAT-BOTTOM TRENCH DETAIL**



**V-SHAPED TRENCH DETAIL**

**SILT FENCE**

NOT TO SCALE

**PROJECT CONNECT - WETLAND PERMIT DRAWINGS**

**TYPICAL WETLAND PROTECTION PLAN**

CLIENT:

**RICHLAND COUNTY AND STATE OF SC**

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CGW

SHEET: 1.37

SCALE: NTS

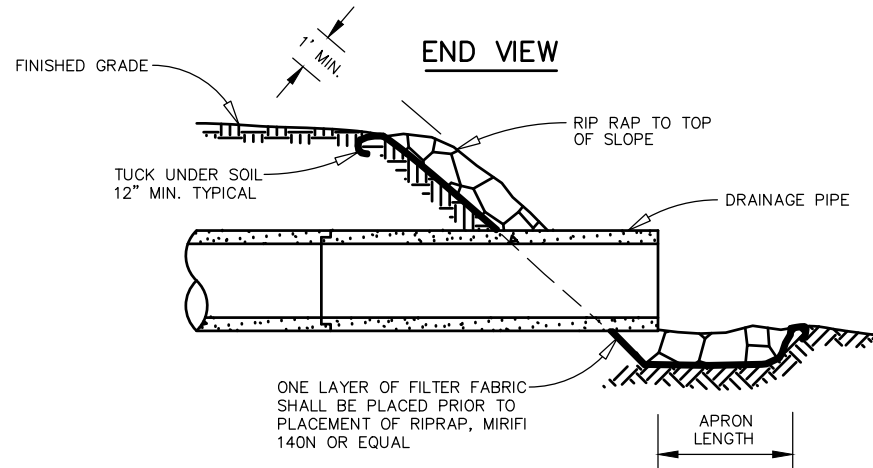
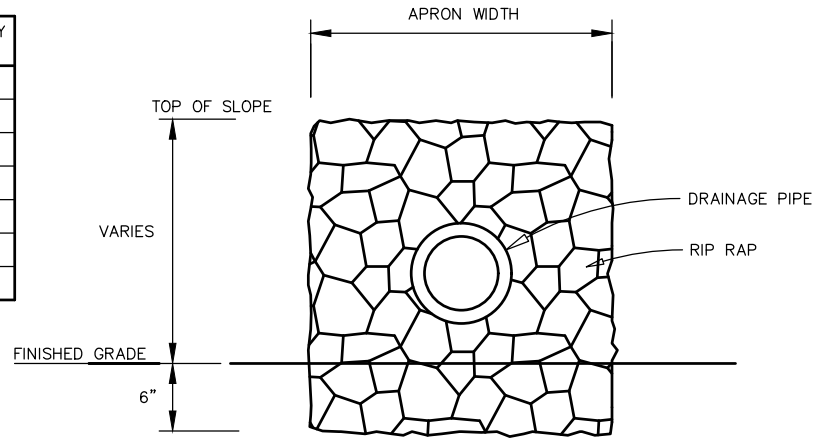


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**Permitted Plans**

PIPE SIZE (INCHES)	APRON WIDTH (FEET)	APRON LENGTH (FEET)	QUANTITY (S.Y.)
15	6	18	12
18	6	18	12
24	8	22	20
30	10	28	31
36	12	32	43
42	16	36	68
48	16	44	78



**SECTION**  
**RIP RAP DETAIL**

NOT TO SCALE



**PROJECT CONNECT - WETLAND PERMIT DRAWINGS**

**TYPICAL WETLAND PROTECTION PLAN**

CLIENT:

**RICHLAND COUNTY AND STATE OF SC**

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

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SHEET: 1.38

SCALE: NTS

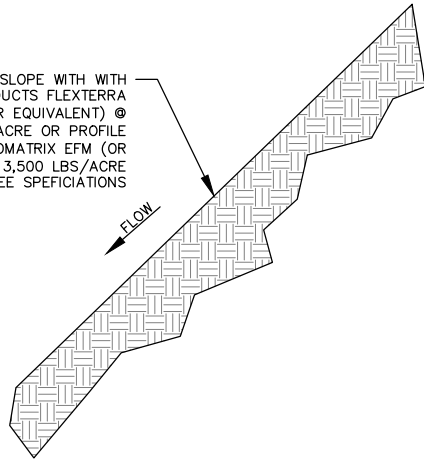


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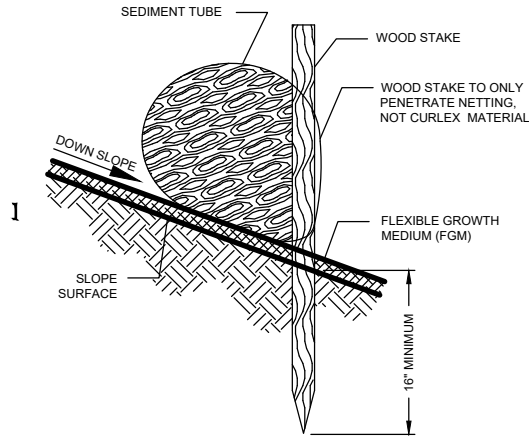
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**Permitted Plans**

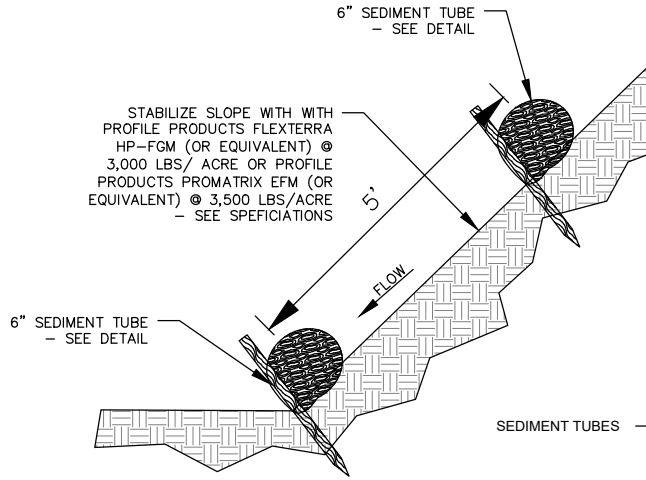
STABILIZE SLOPE WITH WITH  
PROFILE PRODUCTS FLEXTERRA  
HP-FGM (OR EQUIVALENT) @  
3,000 LBS/ ACRE OR PROFILE  
PRODUCTS PROMATRIX EFM (OR  
EQUIVALENT) @ 3,500 LBS/ACRE  
- SEE SPEFICIATIONS



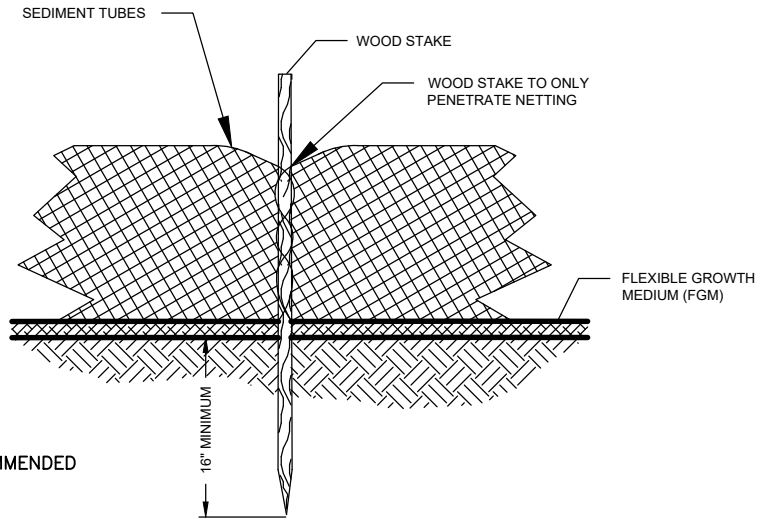
2:1 SLOPE < 50 FEET  
(OR AS NOTED ON PLANS)



STABILIZE SLOPE WITH WITH  
PROFILE PRODUCTS FLEXTERRA  
HP-FGM (OR EQUIVALENT) @  
3,000 LBS/ ACRE OR PROFILE  
PRODUCTS PROMATRIX EFM (OR  
EQUIVALENT) @ 3,500 LBS/ACRE  
- SEE SPEFICIATIONS



2:1 SLOPE > 50 FEET  
(OR AS NOTED ON PLANS)



**GENERAL NOTES**

1. SLOPE PROTECTION DETAILS SHOWN ARE GENERAL GUIDELINES. ADDITIONAL SLOPE PROTECTION MEASURES MAY BE NECESSARY, DEPENDING ON SITE AND WEATHER CONDITIONS.
2. SEE MANUFACTURERS SPECIFICATIONS, WHERE APPLICABLE.
3. EXCESS SOIL SHALL NOT BE PLACED WITHIN WATERS OF THE U.S.

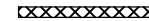
**NOTE:**

1  $\frac{1}{8}$ " X 1  $\frac{1}{8}$ " X 30" WOODEN STAKES ARE RECOMMENDED FOR 6", 9", AND 12" SEDIMENT TUBES.

1  $\frac{1}{8}$ " X 1  $\frac{1}{8}$ " X 48" WOODEN STAKES ARE RECOMMENDED FOR 20" SEDIMENT TUBES.

SLOPE PROTECTION DETAIL

NOT TO SCALE



**PROJECT CONNECT - WETLAND PERMIT DRAWINGS**

**TYPICAL WETLAND PROTECTION PLAN**

CLIENT:

**RICHLAND COUNTY AND STATE OF SC**

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CGW

SHEET: 1.39

SCALE: NTS



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**Permitted Plans**

D	L	Bo	PEAK FLOW (CFS)	TOTAL STORAGE VOL. (CU. FT.)	SEDIMENT STORAGE VOLUME (CU. FT.)
15'	17.5'	3.5'	24.1	838	250
20'	20.0'	6.0'	32.1	1263	406
25'	22.5'	8.5'	40.1	1766	601
30'	25.0'	11.0'	48.2	2348	836

### TYPICAL ROCK DIKE PLAN DIMENSIONS

**WHEN AND WHERE TO USE IT:**

ROCK SEDIMENT DIKES ARE MOST EFFECTIVE IN AREAS WHERE SEDIMENT CONTROL IS NEEDED WITH MINIMAL DISTURBANCE. THEY CAN BE USED AS SEDIMENT CONTROL STRUCTURES FOR THE OUTFALLS OF DIVERSION SWALES, DIVERSION DIKES, IN LOW AREAS OR OTHER AREAS WHERE CONCENTRATED SEDIMENT LADEN FLOW IS EXPECTED. ROCK SEDIMENT DIKES SHOULD NOT BE PLACED IN WATERS OF THE STATE OR ANY OTHER STREAMS THAT HAVE A BASE FLOW. MAXIMUM 2 - ACRE DRAINAGE AREA TO DIKE.

**INSTALLATION:**

A NON-WOVEN GEOTEXTILE FABRIC SHALL BE INSTALLED OVER THE SOIL SURFACE WHERE THE ROCK SEDIMENT DIKE IS TO BE PLACED.

THE BODY OF THE ROCK SEDIMENT DIKE SHALL BE COMPOSED OF MINIMUM 9-INCH D50 RIPRAP.

THE UPSTREAM FACE OF THE ROCK SEDIMENT DIKE SHALL BE COMPOSED OF A 1-FOOT THICK LAYER OF 3/4-INCH TO 1-INCH D50 WASHED STONE PLACED AT A SLOPE OF 2H:1V.

ROCK SEDIMENT DIKES SHALL HAVE A MINIMUM TOP FLOW LENGTH OF 3-FEET (2-FOOT FLOW LENGTH THROUGH THE RIPRAP AND 1-FOOT FLOW LENGTH THROUGH THE WASHED STONE).

THE ROCK MUST BE PLACED BY HAND OR MECHANICAL PLACEMENT (NO DUMPING OF ROCK TO FORM THE SEDIMENT DIKE) TO ACHIEVE THE PROPER

**DIMENSIONS:**

A SEDIMENT SUMP SHALL BE LOCATED ON THE UPSTREAM SIDE OF THE STRUCTURE TO PROVIDE SEDIMENT STORAGE. THE UPSTREAM SIDE OF THE SEDIMENT SUMP SHALL HAVE A SLOPE OF 5H:1V TO INHIBIT EROSION OF THE SEDIMENT STORAGE AREA. THE MINIMUM DEPTH OF THE SEDIMENT SUMP SHALL BE 2-FEET. MARK THE SEDIMENT CLEANOUT LEVEL OF THE SEDIMENT DIKE WITH A STAKE IN THE FIELD.

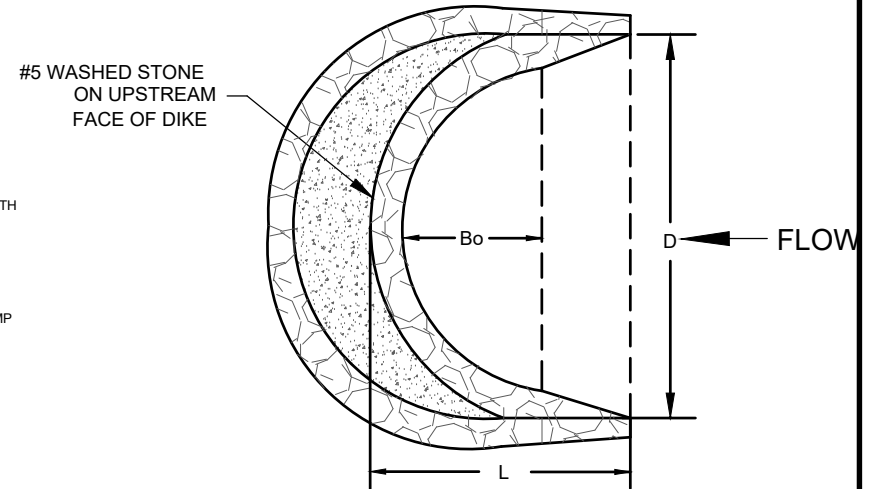
SEED AND MULCH ALL DISTURBED AREAS.

**INSPECTION AND MAINTENANCE:**

CONTRACTOR SHALL PROVIDE CONTINUAL MONITORING, REGULAR MAINTENANCE AND REGULAR SEDIMENT REMOVAL.

REMOVE SEDIMENT WHEN IT REACHES 50% OF THE SEDIMENT STORAGE VOLUME OR WHEN REACHES THE TOP OF CLEANOUT STAKE. REMOVED SEDIMENT FROM THE SUMP SHOULD BE REMOVED FROM, OR STABILIZED ON SITE.

ALL ROCK SEDIMENT DIKES SHOULD BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THEY ARE NO LONGER NEEDED. DISTURBED AREAS RESULTING FROM THE REMOVAL OF ROCK SEDIMENT DIKES SHOULD BE PERMANENTLY STABILIZED.



### ROCK SEDIMENT DIKES

NOT TO SCALE

## PROJECT CONNECT - WETLAND PERMIT DRAWINGS

### TYPICAL WETLAND PROTECTION PLAN

CLIENT:

RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

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DRAWN BY: BEB

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SHEET: 1.40

SCALE: NTS



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Permitted Plans

- PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.  
NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
- BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30 CM) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE THE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
- ROLL THE RECP's (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
- THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" - 5" (5 CM - 12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
- CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH.  
NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.

### SLOPE INSTALLATION



### EROSION CONTROL BLANKET

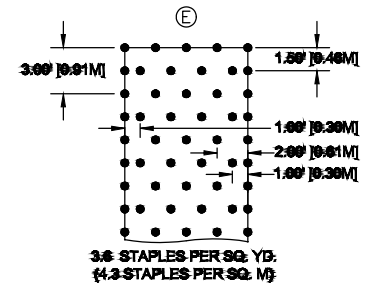
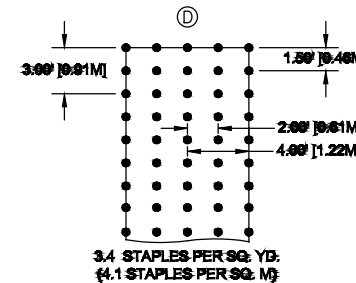
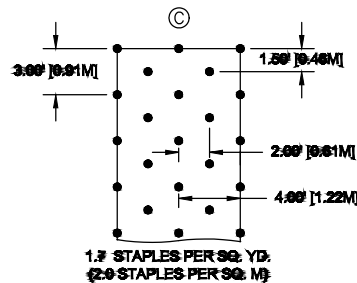
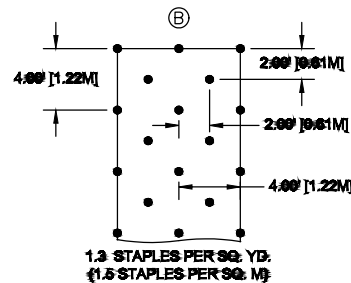
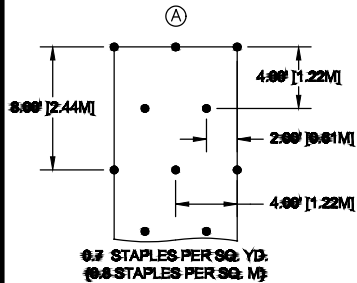
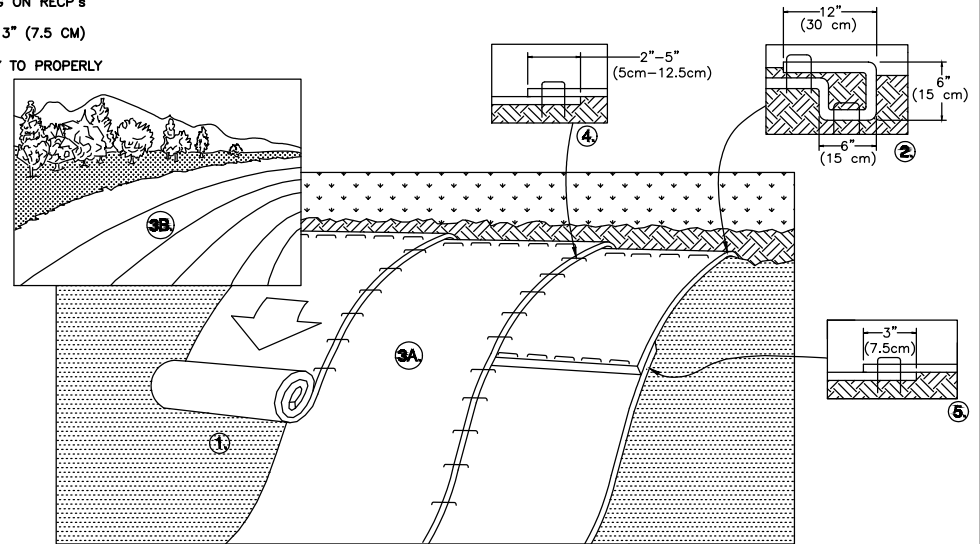
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### STAPLE PATTERN GUIDE 8' (2.4 M) WIDE ROLLS



## PROJECT CONNECT - WETLAND PERMIT DRAWINGS

### TYPICAL WETLAND PROTECTION PLAN

CLIENT:

**RICHLAND COUNTY AND STATE OF SC**

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23

JOB NUMBER: J-27015.0007

DRAWN BY: BEB

REVIEWED BY: CGW

SHEET: 1.41

SCALE: NTS



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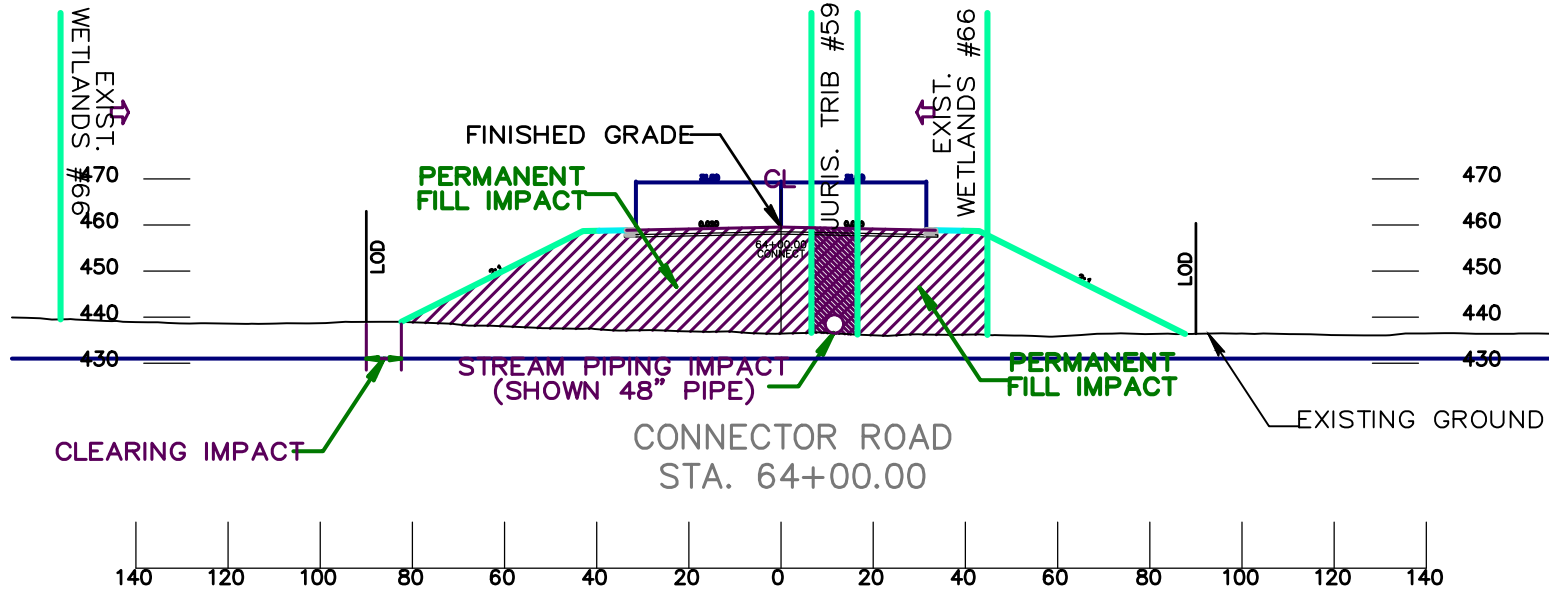
**Permitted Plans**



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REPRESENTATIVE SECTION SHOWN.  
FINAL CROSS SECTIONS WILL BE PROVIDED  
WITH FINAL DESIGN AND PERMIT MODIFICATION

# EXAMPLE WETLAND/STREAM IMPACT



LEGEND	
	PERMANENT WETLAND FILL IMPACT
	PERMANENT JURIS. TRIB. FILL IMPACT
	REINFORCED CONCRETE PIPE

SCOUT INTERCHANGE  
PROJECT ID P-042443  
I-77 EXIT 26 NEW INTERCHANGE  
AND CONNECTING ROADS



**Permitted Plans**

PROJECT CONNECT - PERMIT DRAWINGS

TYPICAL DOT CROSS SECTION

CLIENT:  
RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC

DATE: 10/27/23      DRAWN BY: BEB      SHEET: 1.42

JOB NUMBER: J-27015.0007      REVIEWED BY: CGW      SCALE: 1" = 500'

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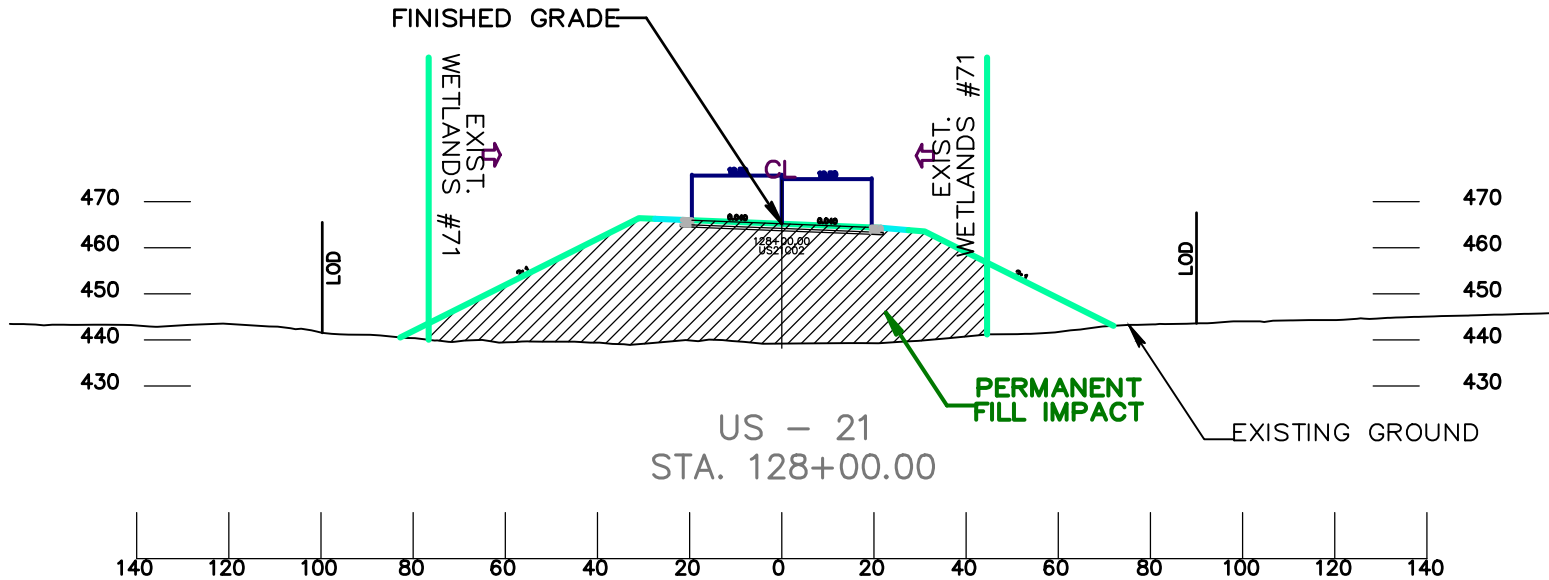
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REPRESENTATIVE SECTION SHOWN.  
FINAL CROSS SECTIONS WILL BE PROVIDED  
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# EXAMPLE WETLAND IMPACT



LEGEND	
	PERMANENT WETLAND FILL IMPACT
	PERMANENT JURIS. TRIB. FILL IMPACT
	REINFORCED CONCRETE PIPE

SCOUT INTERCHANGE  
PROJECT ID P-042443  
I-77 EXIT 26 NEW INTERCHANGE  
AND CONNECTING ROADS



**Permitted Plans**

PROJECT CONNECT - PERMIT DRAWINGS

TYPICAL DOT CROSS SECTION

CLIENT:  
RICHLAND COUNTY AND STATE OF SC

LOCATION: BLYTHEWOOD, SC  
DATE: 10/27/23  
JOB NUMBER: J-27015.0007

DRAWN BY: BEB  
REVIEWED BY: CGW

SHEET: 1.43  
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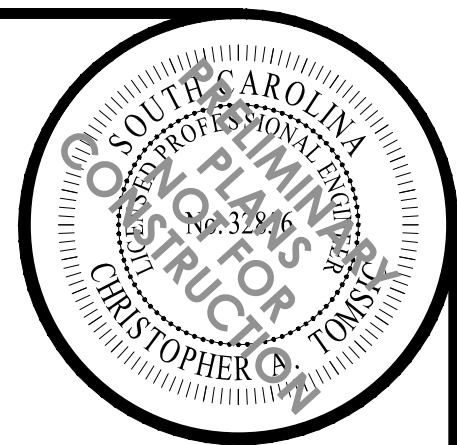
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# SCOUT MOTORS BLYTHEWOOD FACILITY

RICHLAND COUNTY, SOUTH CAROLINA  
 CONGAREE RIVER TRACT FINAL PERMITTEE-RESPONSIBLE MITIGATION PLAN  
 USACE ACTION ID: SAC-2023-00690  
 PRELIMINARY PLANS - NOT FOR CONSTRUCTION



NO.	DESCRIPTION	DATE
1	FMP	11/30/2023

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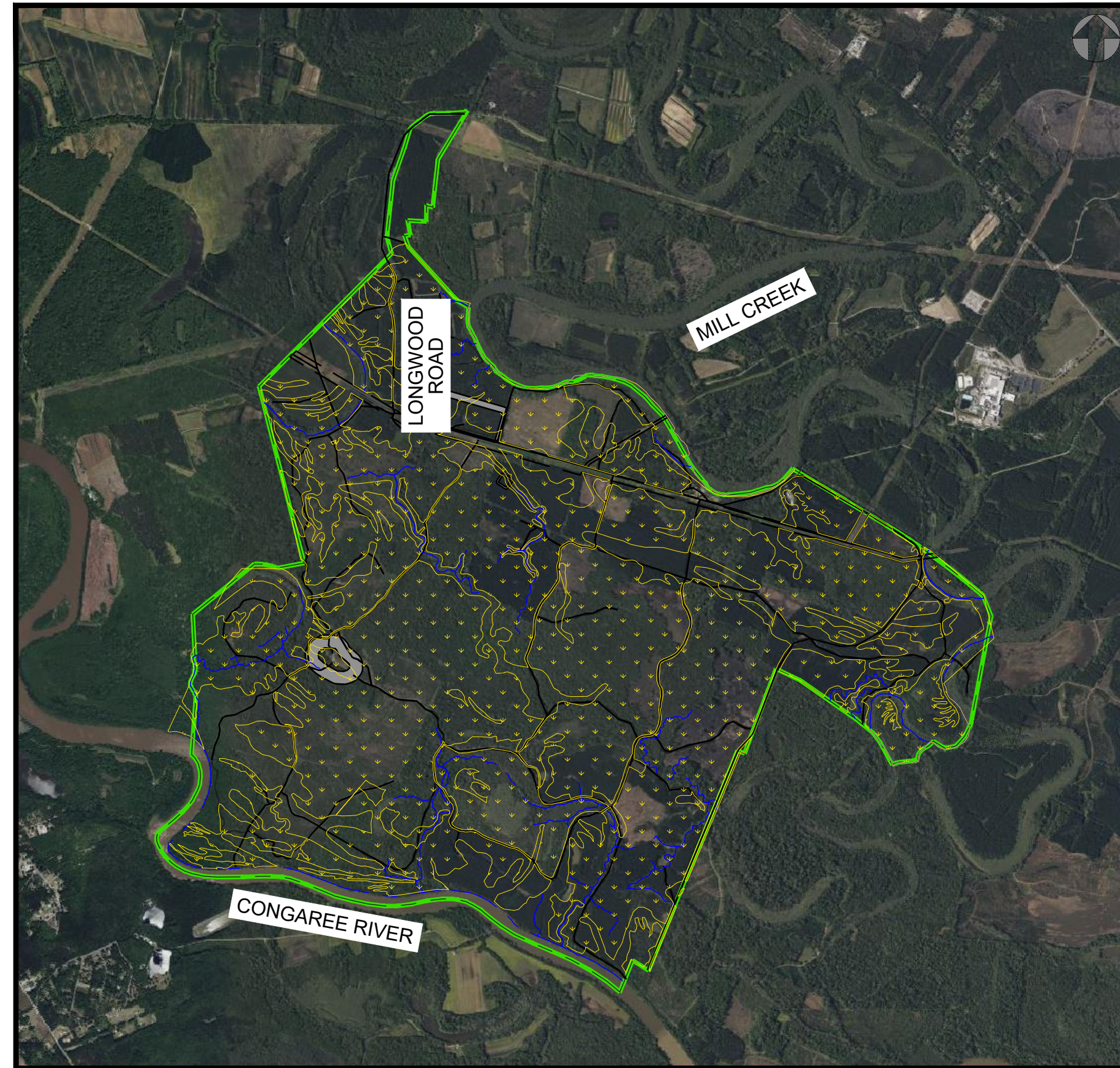
**WLS ENGINEERING PLLC**  
 6 DULA SPRINGS RD., WEAVERVILLE, NC 28787  
 FIRM LICENSE NO. P-1480

DESIGNED BY:	DATE:
KMV	11/30/2023
MDO	23-010
TG	
AS NOTED	

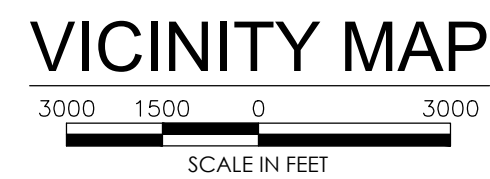
**PROJECT NAME**  
 SCOUT MOTORS BLYTHEWOOD FACILITY  
 PERMITTEE-RESPONSIBLE MITIGATION PLAN  
 RICHLAND COUNTY, SOUTH CAROLINA

**SHEET NAME**  
 TITLE SHEET

**SHEET NO.**  
 1

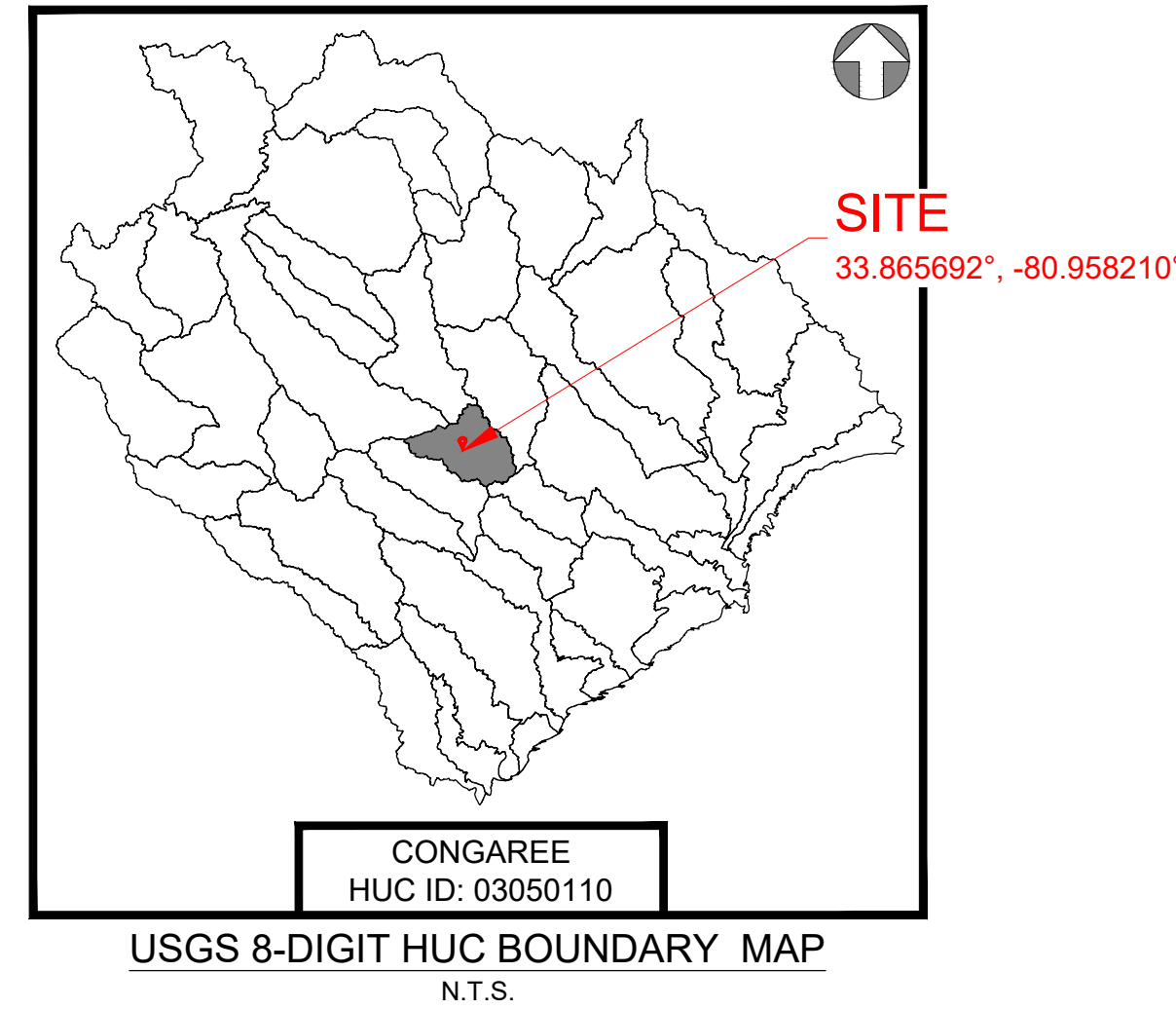


AERIAL IMAGE BY BING VIA AUTODESK ACCESSED ON 08-15-2023.



**LEGEND**

- PROJECT BOUNDARY
- WETLANDS
- STREAMS
- ROADS



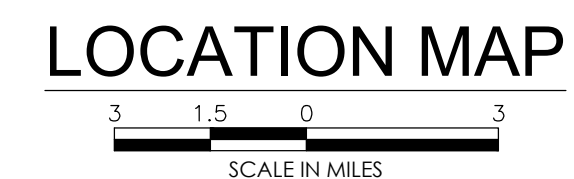
USGS 8-DIGIT HUC BOUNDARY MAP  
 N.T.S.

**SHEET INDEX**

- 1 TITLE SHEET
- 2 GENERAL NOTES & SPECIAL NOTES
- 3 PROJECT KEYMAP & LEGEND
- 4 - 9 OVERALL PLAN AREAS 1-6
- 10 - 15 ENLARGEMENT AREAS A-X
- 16 - 20 PROPOSED PLANTING PLANS
- 21 - 24 DETAILS



ROAD MAPPING BY BING VIA AUTODESK ACCESSED ON 09-14-2023.



**REFERENCE**

1. HORIZONTAL DATUM IS SOUTH CAROLINA STATE PLANE INTERNATIONAL FOOT NAD 83 (2011)
2. VERTICAL DATUM IS NAVD88 (GEOID12B)

**NOTES**

1. THE PLANS HAVE BEEN CREATED ON ANSI D FULL BLEED (22"x34") PAPER. FOR REDUCTIONS, REFER TO GRAPHIC SCALE. WHEN PLOTTED ON 11"x17" PAPER, THIS PLAN SET WILL NOT BE TO SCALE.
2. THE PLANS HAVE BEEN CREATED FOR FULL COLOR PLOTTING. ANY SET OF THE PLANS THAT IS NOT PLOTTED IN FULL COLOR SHALL NOT BE CONSIDERED ADEQUATE FOR CONSTRUCTION PURPOSES.  
 \*\*WARNING\*\*: INFORMATION MAY BE LOST IN COPYING AND/OR GRAY SCALE PLOTTING.

**Permitted Plans**



CONSTRUCTION SEQUENCE

THE ENGINEER WILL PROVIDE CONSTRUCTION OBSERVATION DURING THE CONSTRUCTION PHASE OF THIS PROJECT. THE FOLLOWING CONSTRUCTION SEQUENCE SHALL BE USED DURING PROJECT CONSTRUCTION IMPLEMENTATION...

- 1. THE CONTRACTOR SHALL NOTIFY "SC811" BEFORE ANY EXCAVATION BEGINS...
2. THE CONTRACTOR SHALL PREPARE STABILIZED CONSTRUCTION ENTRANCES, HAUL ROADS AND SHALL MOBILIZE EQUIPMENT...
3. CONSTRUCTION TRAFFIC SHALL BE RESTRICTED TO THE AREA DENOTED AS "LIMITS OF DISTURBANCE" OR "HAUL ROADS" AS SHOWN ON THE DESIGN PLANS...

GENERAL NOTES

- 1. THE PROJECT SITE IS LOCATED APPROXIMATELY ELEVEN MILES SOUTHEAST OF COLUMBIA, SC IN RICHLAND COUNTY ( 33.881281° - 80.969418°) AS SHOWN ON THE COVER SHEET VICINITY MAP...
2. THE PROJECT SITE BOUNDARIES ARE SHOWN ON THE DESIGN PLANS. THE CONTRACTOR SHALL PERFORM ALL RELATED WORK ACTIVITIES WITHIN THE PROJECT SITE BOUNDARIES AND/OR WITHIN THE LIMITS OF DISTURBANCE (LOD)...

GRADING NOTES

- 1. NO GRADING ACTIVITIES SHALL OCCUR BEYOND THE PROJECT LIMITS OF DISTURBANCE (LOD) AS SHOWN ON THE DESIGN PLANS.
2. ONCE PROPOSED ELEVATIONS ARE ACHIEVED AS SHOWN ON THE DESIGN PLANS, THE GRADED AREAS SHALL BE STABILIZED USING TECHNIQUES DESCRIBED IN THE TECHNICAL SPECIFICATIONS AND APPROVED SWPPP/ESC PLAN...

CONTRACTOR SHALL REVIEW ALL APPLICABLE PERMITS FOR THIS PROJECT AND ALL WORK SHALL BE IN STRICT CONFORMANCE WITH THE CONDITIONS OF EACH PERMIT.

GOVERNING SPECIFICATIONS

THE CONSTRUCTION OF REGULATED STREAM(S) SHALL FOLLOW ALL GOVERNING AUTHORITIES' REGULATIONS.

BENCHMARKS

THE CONTRACTOR SHALL BE RESPONSIBLE FOR HOLDING, SETTING, AND MAINTAINING BENCHMARKS LOCATIONS THROUGHOUT THE LIFE OF THE PROJECT. IN THE EVENT THAT A BENCHMARK IS DISTURBED, THE CONTRACTOR AS DIRECTED BY THE ENGINEER, WILL RELOCATE OR REESTABLISH THE BENCHMARK. NO ADDITIONAL PAYMENT OR COMPENSATION WILL BE MADE FOR THIS WORK.

ELEVATION DATUM

ALL ELEVATIONS SHOWN REFER TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

COORDINATES

THE PROJECT DATUM ON THESE PLANS ARE BASED UPON THE SOUTH CAROLINA STATE PLANE SYSTEM (INTERNATIONAL FEET). THE HORIZONTAL DATUM IS BASED ON THE NORTH AMERICAN DATUM OF 1983 (2011) (NAD 83).

VERIFICATION OF DIMENSIONS

THE CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF ALL DESIGN PLAN AND ELEVATION DIMENSIONS PRIOR TO ORDERING MATERIALS FOR THE CONSTRUCTION OF THE VARIOUS BID ITEMS IN THE CONTRACT.

TREE CLEARING

TREE CLEARING ON THIS PROJECT SHALL BE PERFORMED ONLY TO THE EXTENT AND TO THE LIMITS NECESSARY TO CONSTRUCT AND INSTALL THE MEASURES AS SHOWN ON THESE DESIGN PLANS.

WASTE MATERIAL

ALL MATERIAL EXCAVATED AND NOT REUSED IN THE CONSTRUCTION OF THIS PROJECT SHALL BE REMOVED FROM THE PROJECT BOUNDARY AND UNUSED WORK MATERIAL DISPOSED OF BY THE CONTRACTOR IN LOCATION(S) APPROVED BY THE ENGINEER.

FILTER FABRIC

NON-WOVEN FILTER FABRIC SHALL BE PLACED AT IN-STREAM STRUCTURES AND ROAD CROSSINGS AS SHOWN ON THE DETAILS OR UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

UTILITIES

THE CONTRACTOR IS RESPONSIBLE FOR THE INVESTIGATION, LOCATION, SUPPORT, PROTECTION, AND RESTORATION OF ALL EXISTING UTILITIES AND APPURTENANCES WHETHER SHOWN ON THESE PLANS OR NOT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASCERTAIN THE STATUS AND LOCATION OF EACH UTILITY WHEN PERFORMING WORK WHICH MAY AFFECT THESE FACILITIES...

EROSION AND SEDIMENT CONTROL

EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PERFORMED IN ACCORDANCE WITH THE SWPPP AND ESC PLAN. IN THE EVENT THAT THE TEMPORARY EROSION AND POLLUTION CONTROL MEASURES ARE ORDERED BY THE ENGINEER DUE TO THE CONTRACTOR'S NEGLIGENCE, CARELESSNESS, OR FAILURE TO INSTALL PERMANENT CONTROLS AS PART OF THE WORK AS SCHEDULED...

THE FIRST ORDER OF WORK FOR THE CONTRACTOR IS TO INSTALL EROSION AND SEDIMENTATION CONTROL MEASURES AT THE EARLIEST POSSIBLE DATE. INITIAL CLEARING AND GRUBBING IS ONLY TO BE WHAT IS NECESSARY IN ORDER TO ACCOMPLISH THESE OPERATIONS.

IN ADDITION, THE CONTRACTOR IS TO NAME AN INDIVIDUAL TO REVIEW THE EROSION CONTROL FEATURES AT A MINIMUM OF ONCE A WEEK DURING PERIODS OF HEAVY PRECIPITATION AND/OR ACTIVE CONSTRUCTION TO ASSESS THE SUCCESS OF THE EROSION CONTROL STRUCTURES, REVEGETATION EFFORTS, AND SEE THE REPLACEMENT, CLEANING, AND/OR INSTALLATION OF ADDITIONAL FEATURES IF NECESSARY ARE CARRIED OUT.

SITE CLEANUP

DURING CONSTRUCTION AND PRIOR TO ACCEPTANCE OF ANY PUBLIC IMPROVEMENTS, THE OWNER/DEVELOPER SHALL REMOVE OR CAUSE TO BE REMOVED ALL REFUSE, RUBBISH, UNUSED MATERIALS, EXCESS EARTH, FILL ROCK, DEBRIS, AND FOREIGN MATTER FROM ALL PUBLIC RIGHT OF WAY, IMPROVEMENTS, AND/OR EASEMENTS AS WERE DEPOSITED, LEFT, OR RESULTED FROM THE CONSTRUCTION IMPROVEMENTS OF ANY NATURE WITHIN THE DEVELOPMENT...

THIS WORK SHALL BE PERFORMED IN A MANNER WHICH PREVENTS EXCESS SEDIMENT AND EROSION AS WELL AS PREVENTS STORMWATER FROM ACCUMULATING OR PONDING ON THE SITE. THE WORK SHALL ALSO BE PERFORMED IN A MANNER THAT PREVENTS DISRUPTING OR IMPEDING SURFACE DRAINAGE FROM ONSITE OR OFFSITE SOURCES AND PREVENTS ANY NEGATIVE EFFECTS ON ADJACENT PROPERTIES.

FEDERAL, STATE, AND LOCAL LAWS AND SAFETY REGULATIONS

THE CONTRACTOR AND ANY SUB-CONTRACTORS SHALL CONFORM TO APPLICABLE OSHA SAFETY REGULATIONS. THE CONTRACTOR AND ANY SUB-CONTRACTORS SHALL BE SOLELY RESPONSIBLE FOR COMPLYING WITH ALL FEDERAL, STATE, AND LOCAL SAFETY REQUIREMENTS TOGETHER WITH EXERCISING PRECAUTIONS AT ALL TIMES FOR THE PROTECTION OF PERSONS INCLUDING EMPLOYEES AND PROPERTY. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND SUB-CONTRACTOR TO INITIATE, MAINTAIN, AND SUPERVISE ALL SAFETY REQUIREMENTS, PRECAUTIONS, AND PROGRAMS IN CONNECTION WITH THE WORK.

CLEARING & GRUBBING LIMITS

CLEARING LIMITS SHALL BE EXTENDED TO A MAXIMUM LIMIT NECESSARY FOR CONSTRUCTION MATERIALS AND SHALL NOT EXTEND BEYOND CONSTRUCTION BOUNDARIES WHERE EARTHWORK ACTIVITIES ARE TO BE PERFORMED. GRUBBING SHALL ONLY TAKE PLACE WITHIN THE AREA AS NECESSARY. ALL COSTS ASSOCIATED WITH CLEARINGS & GRUBBING SHALL BE CONSIDERED INCIDENTAL TO BID ITEMS CLEARING AND GRUBBING.

SPECIAL NOTES

- A. AS-BUILT DRAWINGS - THE CONTRACTOR AND THE ENGINEER SHALL WORK TOGETHER TO MAINTAIN A SET OF PRINTS SHOWING ANY CHANGES OR CORRECTIONS IN RED. THESE PRINTS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD AT THE COMPLETION OF THE WORK.
B. PERMANENT ACCESS ROADS AND CROSSINGS
1. PERMANENT ROADS AND TEMPORARY ACCESS ROADS THAT CROSS WATERS OF THE UNITED STATES SHALL BE HELD TO THE MINIMUM FEASIBLE NUMBER, WIDTH, AND TOTAL LENGTH CONSISTENT WITH THE PURPOSE OF FUTURE LAND USE...

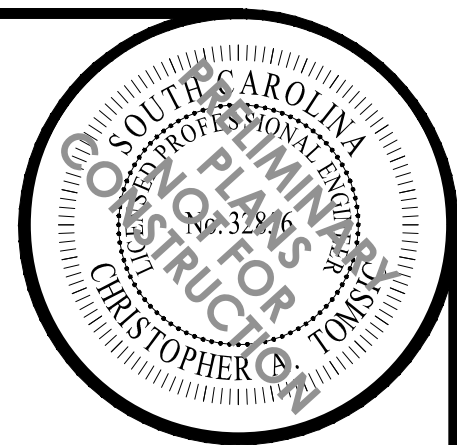


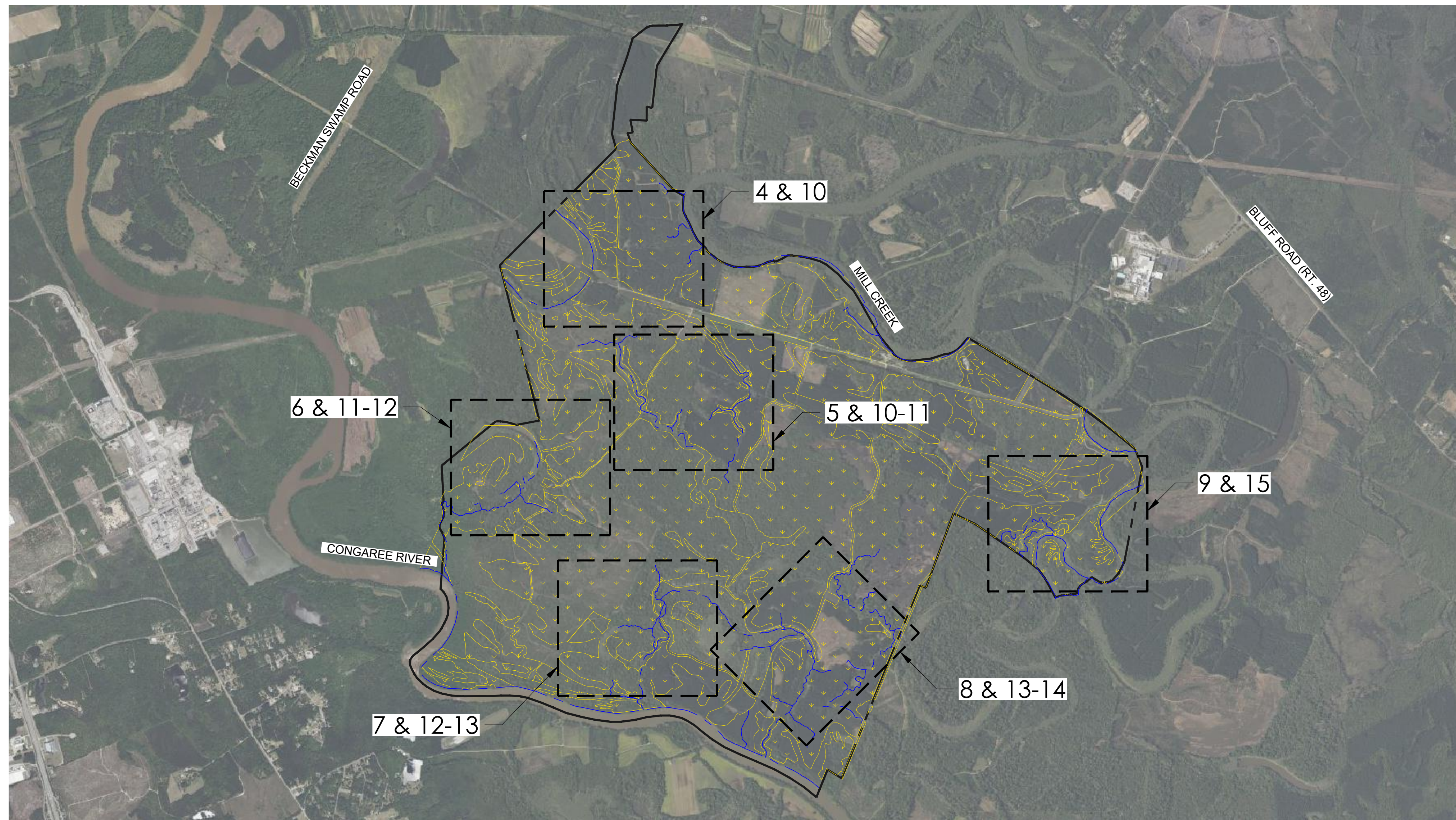
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Drawing Info table: DESIGNED BY: KMY, DRAWN BY: MDO, APPROVED BY: TG, SCALE: AS NOTED, DATE: 11/30/2023, PROJECT NO.: 23-010.

Project Name: SCOUT MOTORS BLYTHEWOOD FACILITY PERMITTEE-RESPONSIBLE MITIGATION PLAN. Location: RICHLAND COUNTY, SOUTH CAROLINA. Sheet Name: GENERAL & SPECIAL NOTES.



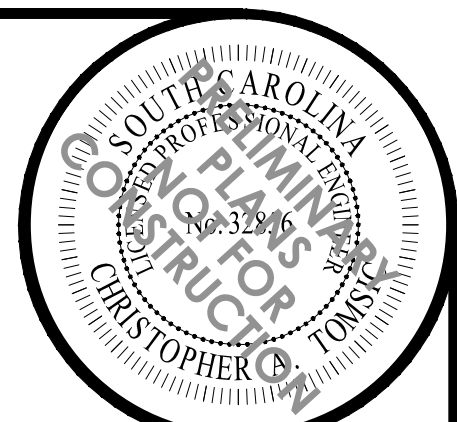


PROJECT KEYMAP

Permitted Plans

LEGEND

---	EXISTING PROPERTY BOUNDARY	---	EXISTING STORM PIPE TO BE REMOVED	CE	CONSERVATION EASEMENT	[Pattern]	CONSTRUCTED STONE RIFFLE
---	EXISTING RIGHT-OF-WAY LINE	---	EXISTING FIRE HYDRANT	C/F	CUT/FILL LIMITS	[Pattern]	LOG STEP POOL
---	EXISTING PROPERTY LINE	---	EXISTING WATER MAIN MARKER	---	PROPOSED ACCESS ROAD DECOMSSION	[Pattern]	CONSTRUCTED BRUSHY RIFFLE
---	EXISTING MAJOR CONTOUR	---	EXISTING ACCESS ROAD TO REMAIN	---	CHANNEL BLOCK/DITCH PLUG	[Pattern]	LOG VANE
---	EXISTING MINOR CONTOUR	---	EXISTING WOODLINE	---	WETLAND RE-ESTABLISHMENT	[Pattern]	TOE WOOD WITH LIVE BRUSH LAYERING
FP	EXISTING 100 YEAR FLOOD PLAIN	---	EXISTING TREE	---	WETLAND PRESERVATION	[Pattern]	GEOLIFT WITH TOE WOOD & BRUSH LAYERING
OHE	EXISTING OVERHEAD ELECTRIC	---	EXISTING FENCE	---	EXISTING WETLAND AREA	[Pattern]	
U	EXISTING UTILITY POLE	---	EXISTING TOP OF STREAM BANK	---	PROPOSED PERMANENT STREAM CROSSING - BRIDGE	[Pattern]	
UGE	EXISTING UNDERGROUND ELECTRIC	---	EXISTING STREAM CHANNEL	---	PROPOSED PERMANENT STREAM CROSSING - FORD	[Pattern]	
EM	EXISTING ELECTRIC PEDESTAL	---	EXISTING CENTERLINE (THALWEG)	---	PROPOSED CHANNEL/DITCH FILL	[Pattern]	
FM	EXISTING FIBER OPTIC	---	PROPOSED MAJOR CONTOUR	---			
FO	EXISTING UNDERGROUND FIBER OPTIC	---	PROPOSED MINOR CONTOUR	---			
FOC	EXISTING FIBER OPTIC MANHOLE	---	PROPOSED TOP OF STREAM BANK	---			
FOE	EXISTING FIBER OPTIC PEDESTAL	---	PROPOSED STREAM CHANNEL	---			
FOF	EXISTING FIBER OPTIC MARKER	---	PROPOSED CENTERLINE (THALWEG)	---			
G	EXISTING GAS MAIN	---	STREAM FLOW DIRECTION	---			
G	EXISTING GAS MAIN MARKER	---	---	---			
SS	EXISTING SANITARY SEWER MAIN	---	EXISTING FEMA FLOOD PLAIN	---			
S	EXISTING SANITARY SEWER MANHOLE	---		---			
ST	EXISTING STORM SEWER MAIN	---		---			
ST	EXISTING STORM SEWER MANHOLE	---		---			
OHT	EXISTING OVERHEAD TELEPHONE	---		---			
UGT	EXISTING UNDERGROUND TELEPHONE	---		---			
TP	EXISTING TELEPHONE PEDESTAL	---		---			
TM	EXISTING TELEPHONE MARKER	---		---			
W	EXISTING WATER MAIN	---		---			



NO.	DESCRIPTION	DATE
1	FMP	11/30/2023

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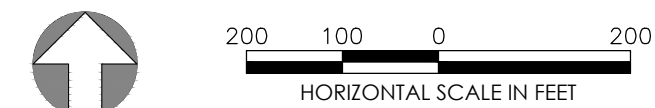
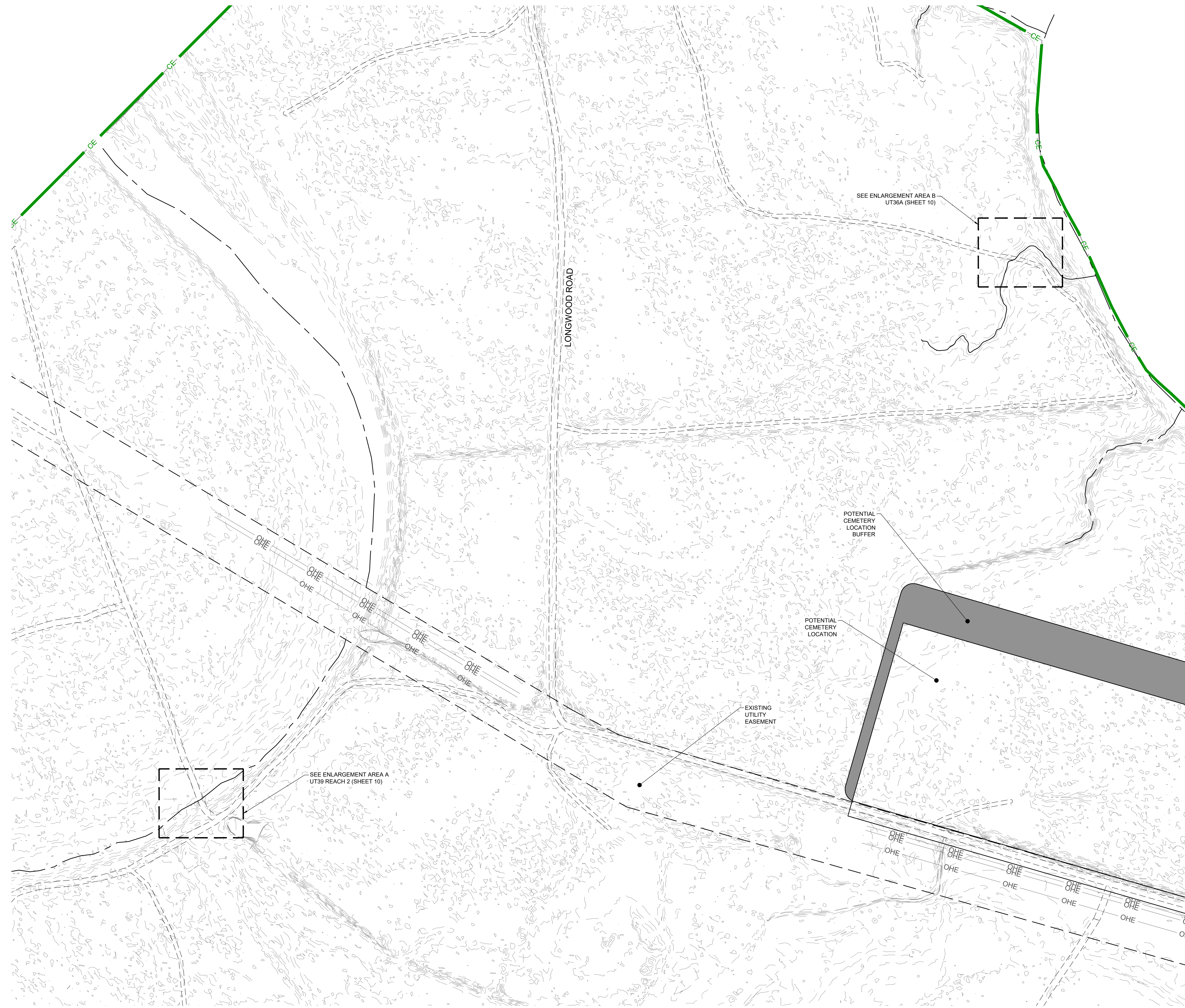
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DRAWN BY:	MDO
APPROVED BY:	TG
SCALE:	AS NOTED
DATE:	11/30/2023
PROJECT NO.:	23-010

**PROJECT NAME**  
 SCOUT MOTORS BLYTHEWOOD FACILITY  
 PERMITTEE-RESPONSIBLE MITIGATION PLAN  
 RICHLAND COUNTY, SOUTH CAROLINA

**SHEET NAME**  
 KEYMAP & LEGEND



FILENAME: 23-010\_PLANS\_OVERALL CROSSINGS.DWG



AREA 1 PLAN

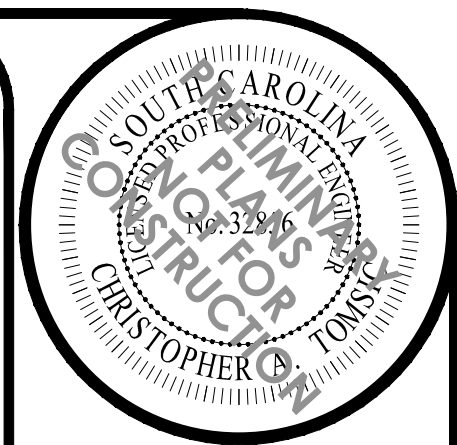
KEYMAP

AREA 1  
PROPERTY BOUNDARY  
AREA 2  
AREA 3  
AREA 4  
AREA 5  
AREA 6

SCALE IN MILES

1 0.5 0 1

Permitted Plans



REVISIONS		
NO.	DESCRIPTION	DATE
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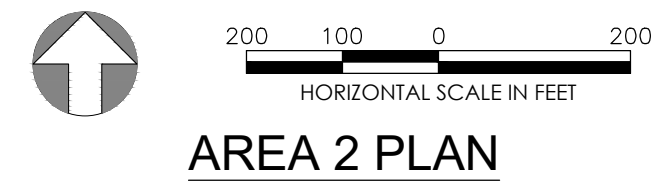
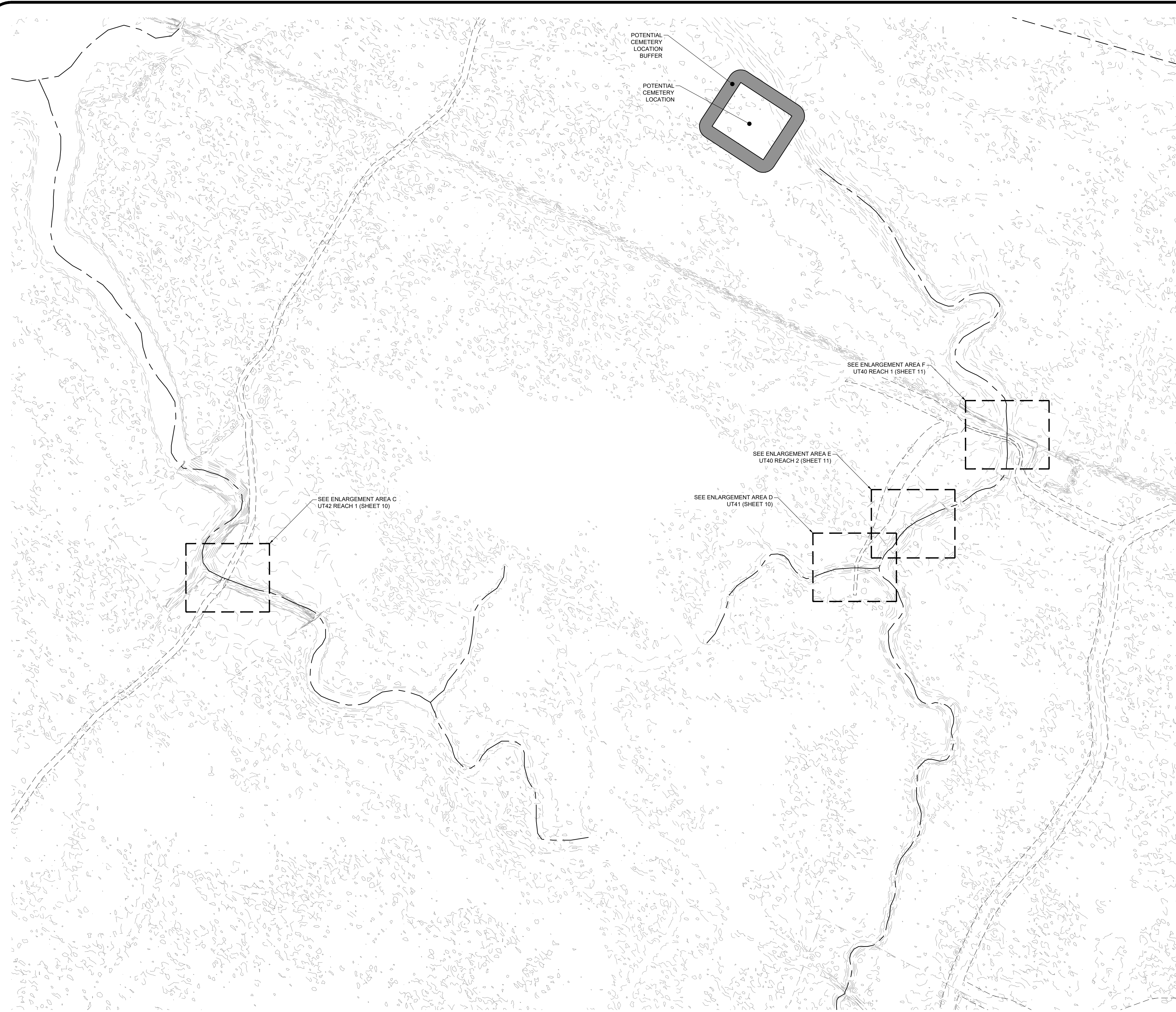
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DRAWING INFO		
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DRAWN BY:	MDO	
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SCALE:	AS NOTED	
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PROJECT NO.:	23-010	

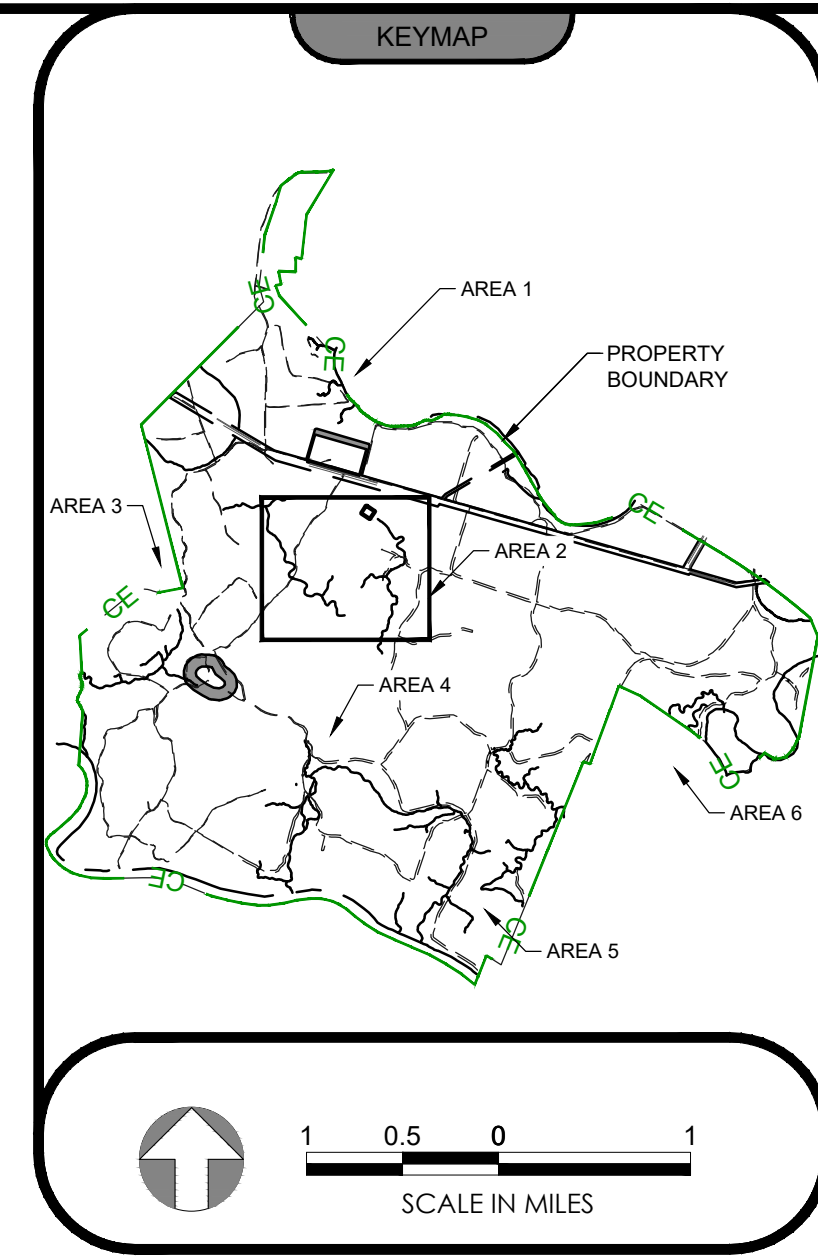
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 PERMITTEE-RESPONSIBLE MITIGATION PLAN**  
 RICHLAND COUNTY, SOUTH CAROLINA

SHEET NAME  
**OVERALL PLAN AREA 1**

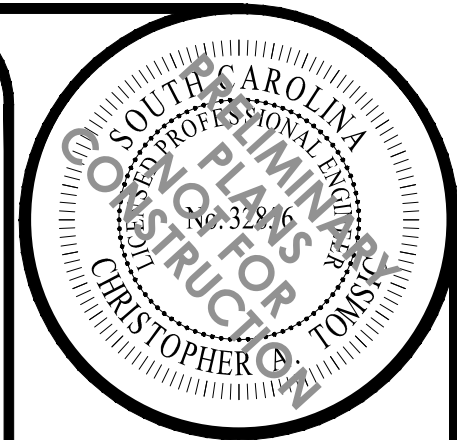




AREA 2 PLAN



Permitted Plans



REVISIONS		
NO.	DESCRIPTION	DATE
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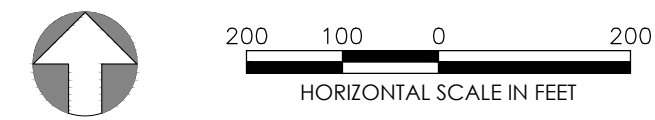
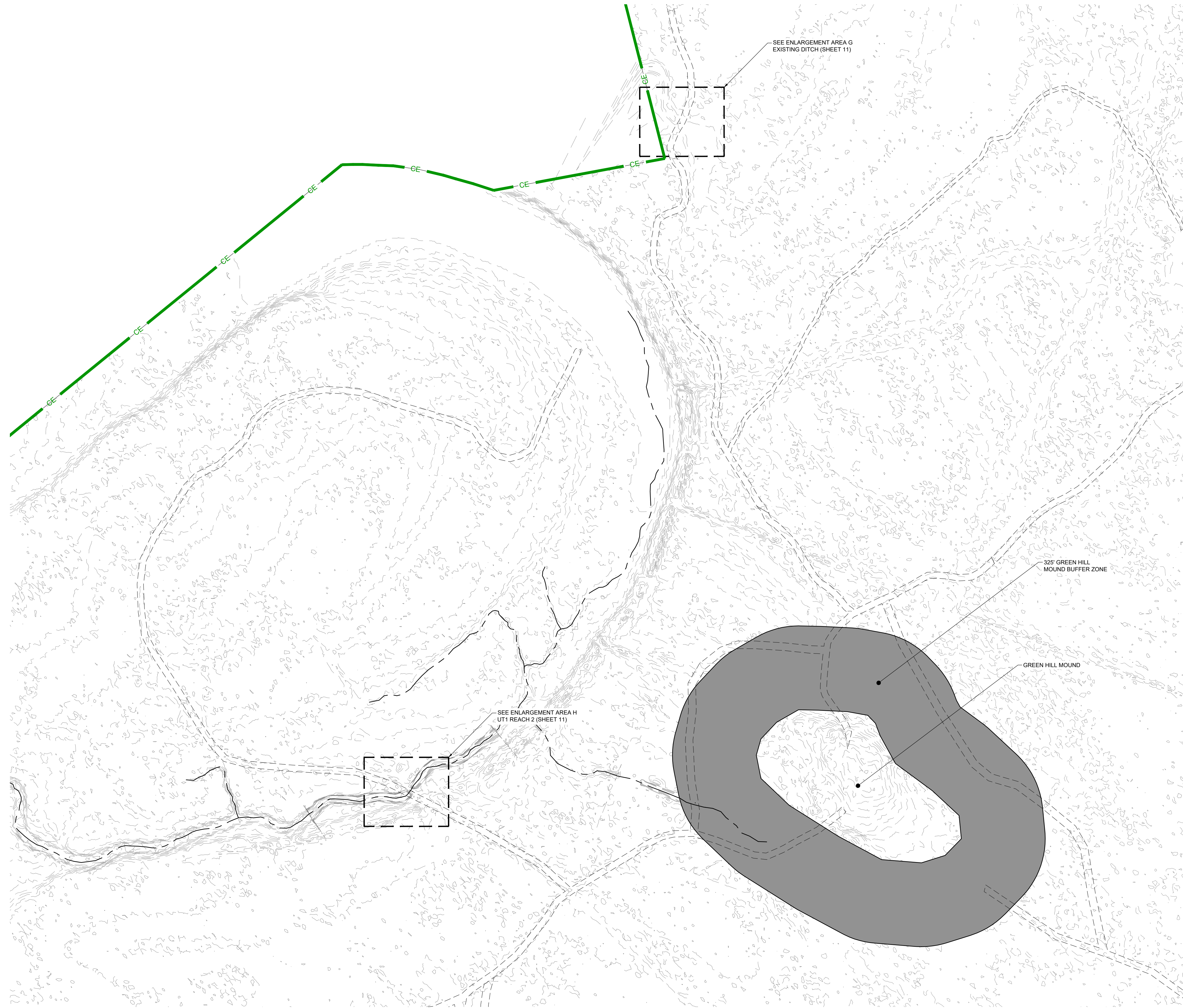
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DESIGNED BY:	KMV	
DRAWN BY:	MDO	TG
APPROVED BY:	AS NOTED	
DATE:	11/30/2023	23-010
PROJECT NO.:		

**PROJECT NAME**  
 SCOUT MOTORS BLYTHEWOOD FACILITY  
 PERMITTEE-RESPONSIBLE MITIGATION PLAN  
 RICHLAND COUNTY, SOUTH CAROLINA

**SHEET NAME**  
 OVERALL PLAN AREA 2



FILENAME: 23-010\_PLANS\_OVERALL\_CROSSINGS.DWG



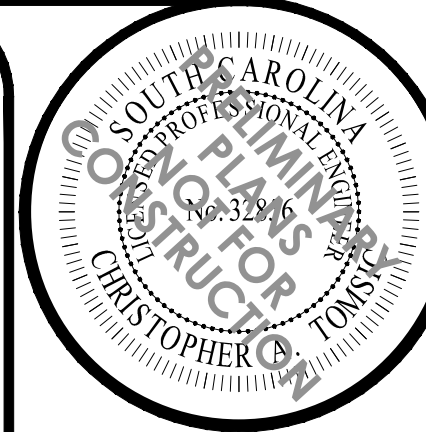
AREA 3 PLAN

KEYMAP

PROPERTY BOUNDARY

SCALE IN MILES

Permitted Plans



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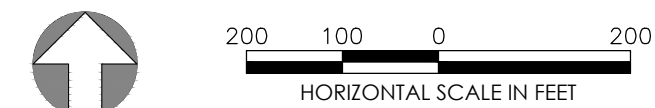
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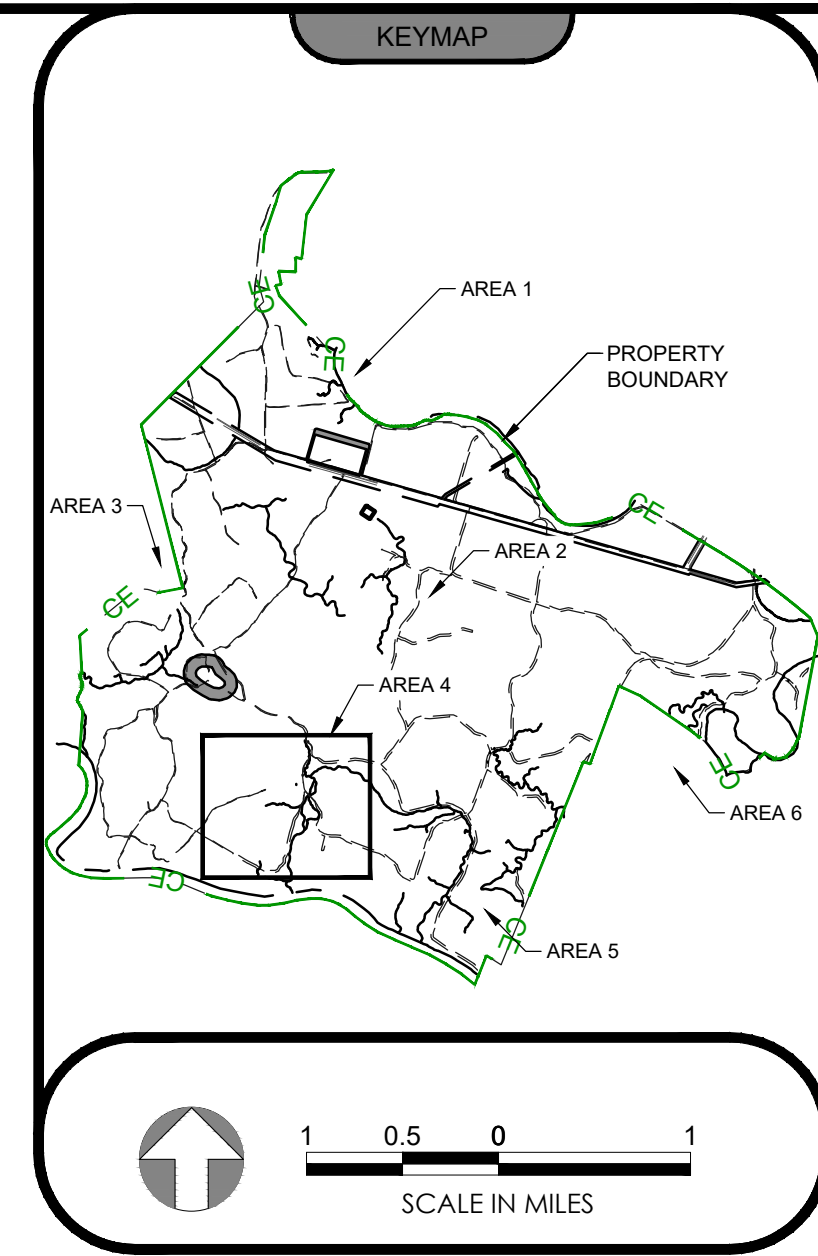
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 OVERALL PLAN AREA 3



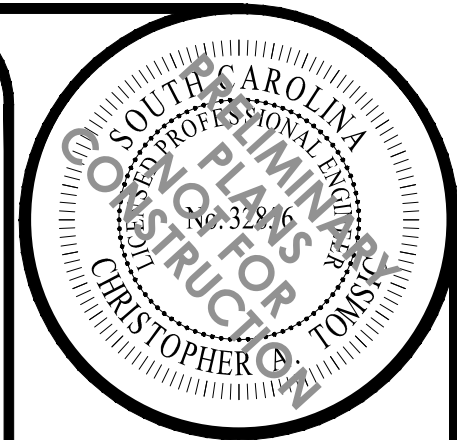
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AREA 4 PLAN



Permitted Plans



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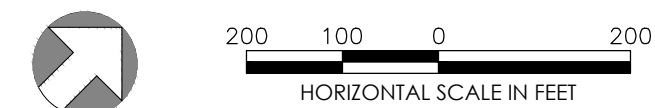
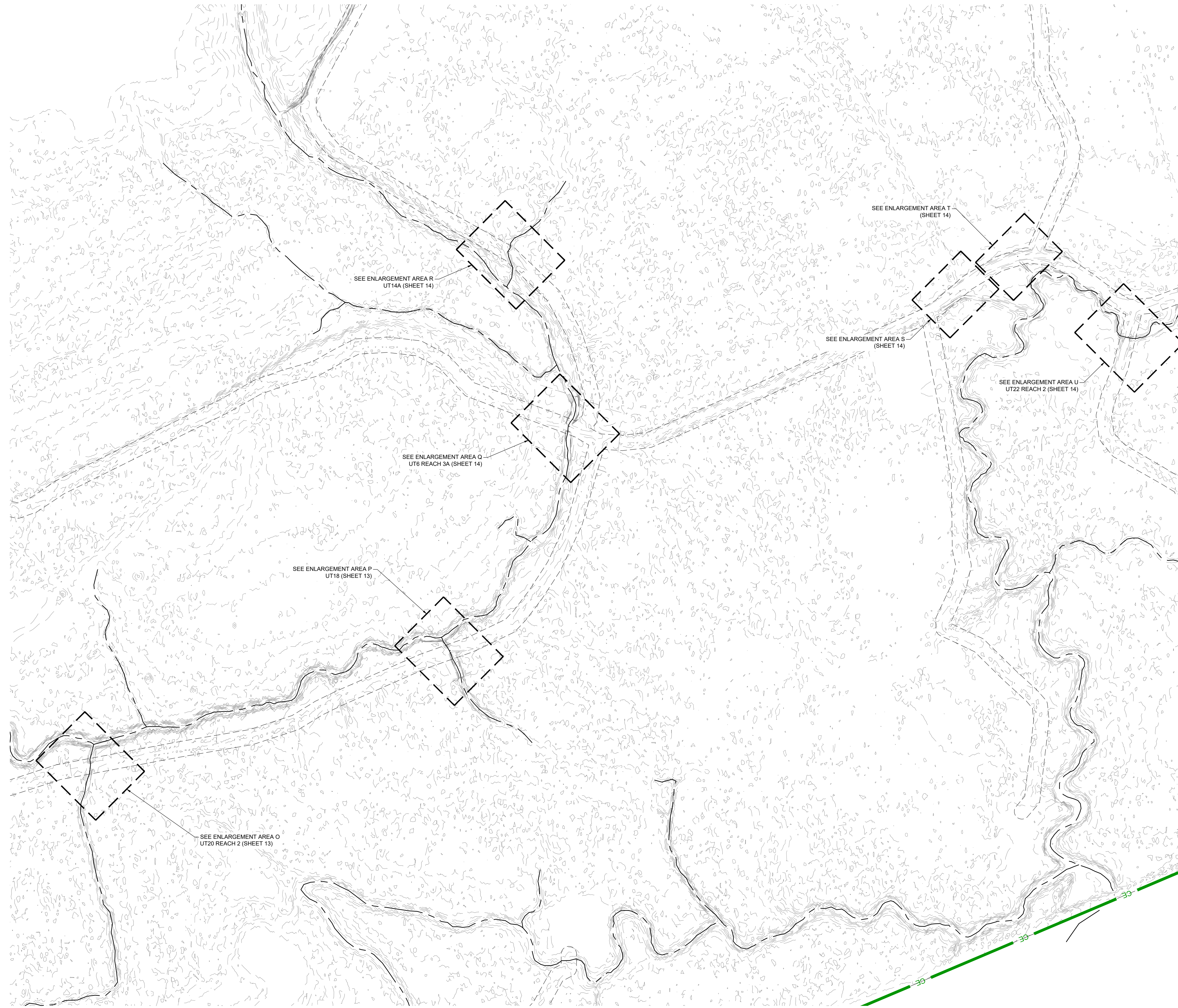
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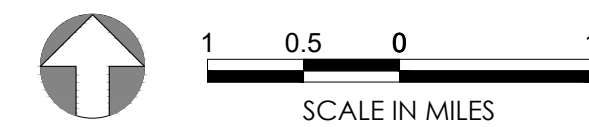
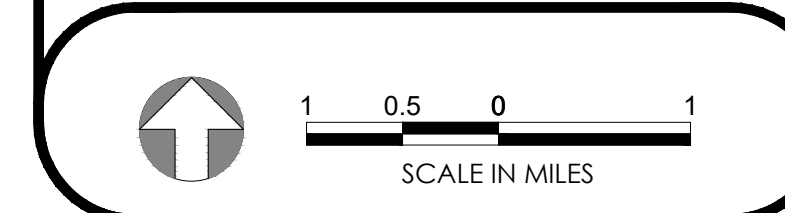
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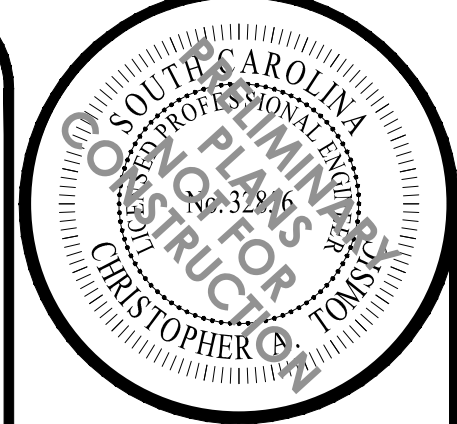
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AREA 5 PLAN



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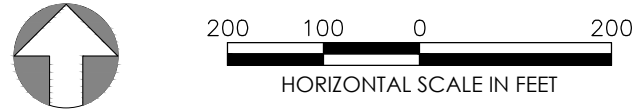
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 RICHLAND COUNTY, SOUTH CAROLINA

**SHEET NO.**  
 8

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**SHEET NAME**  
 OVERALL PLAN AREA 5



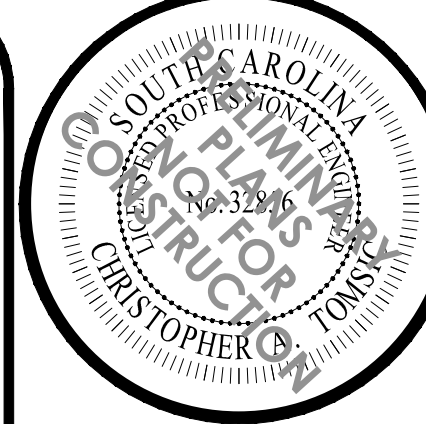


AREA 6 PLAN

KEYMAP

SCALE IN MILES

Permitted Plans



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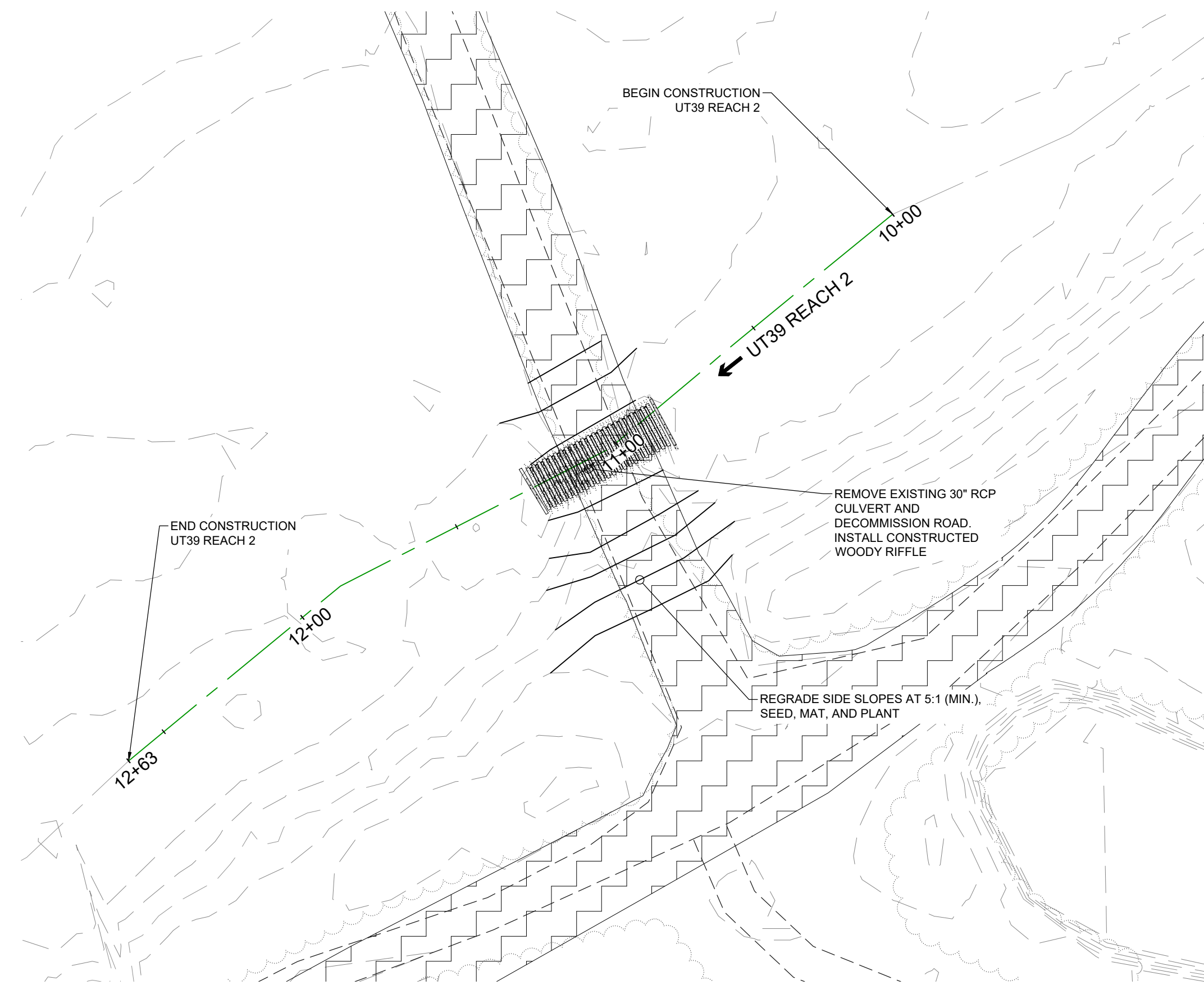
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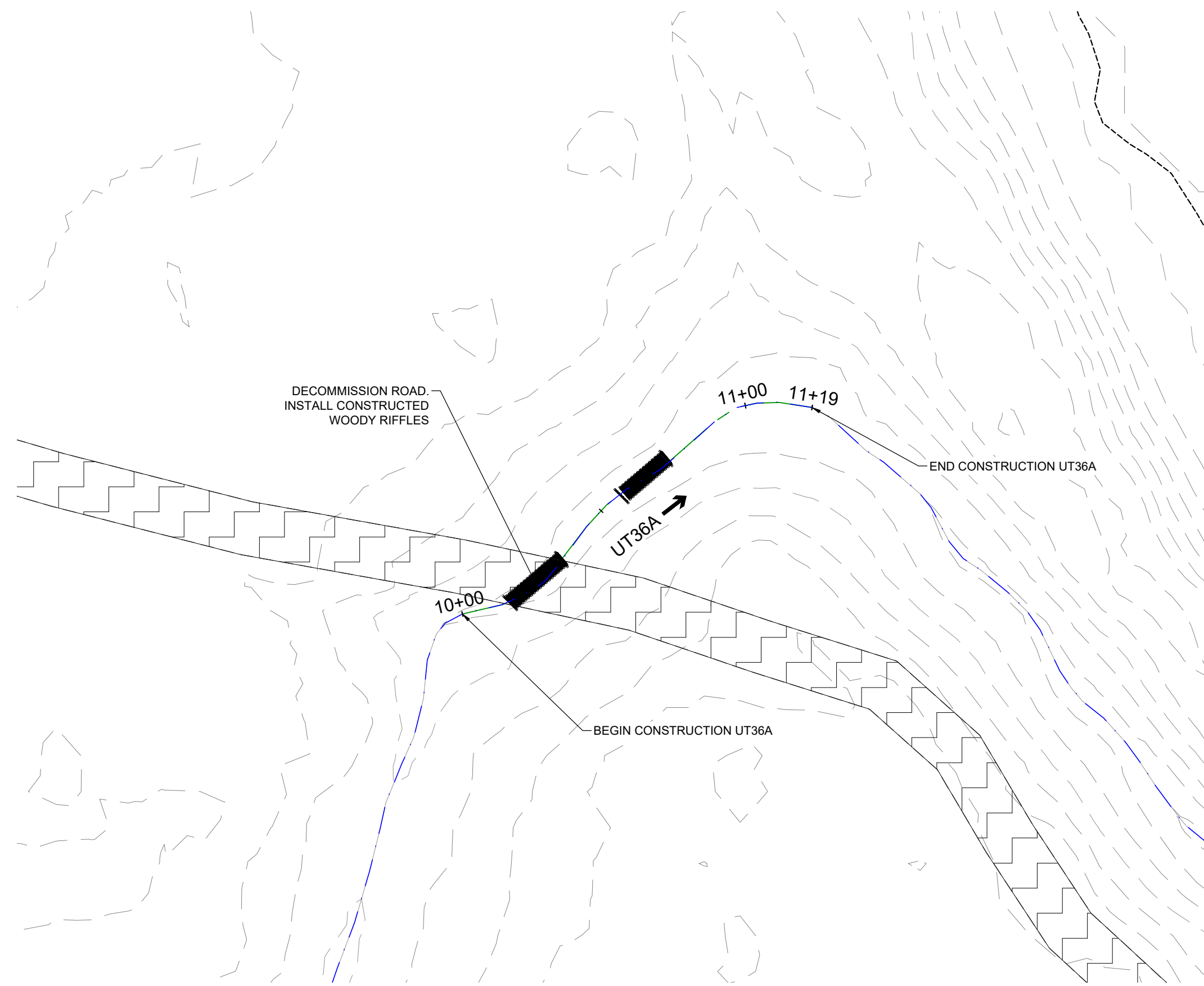
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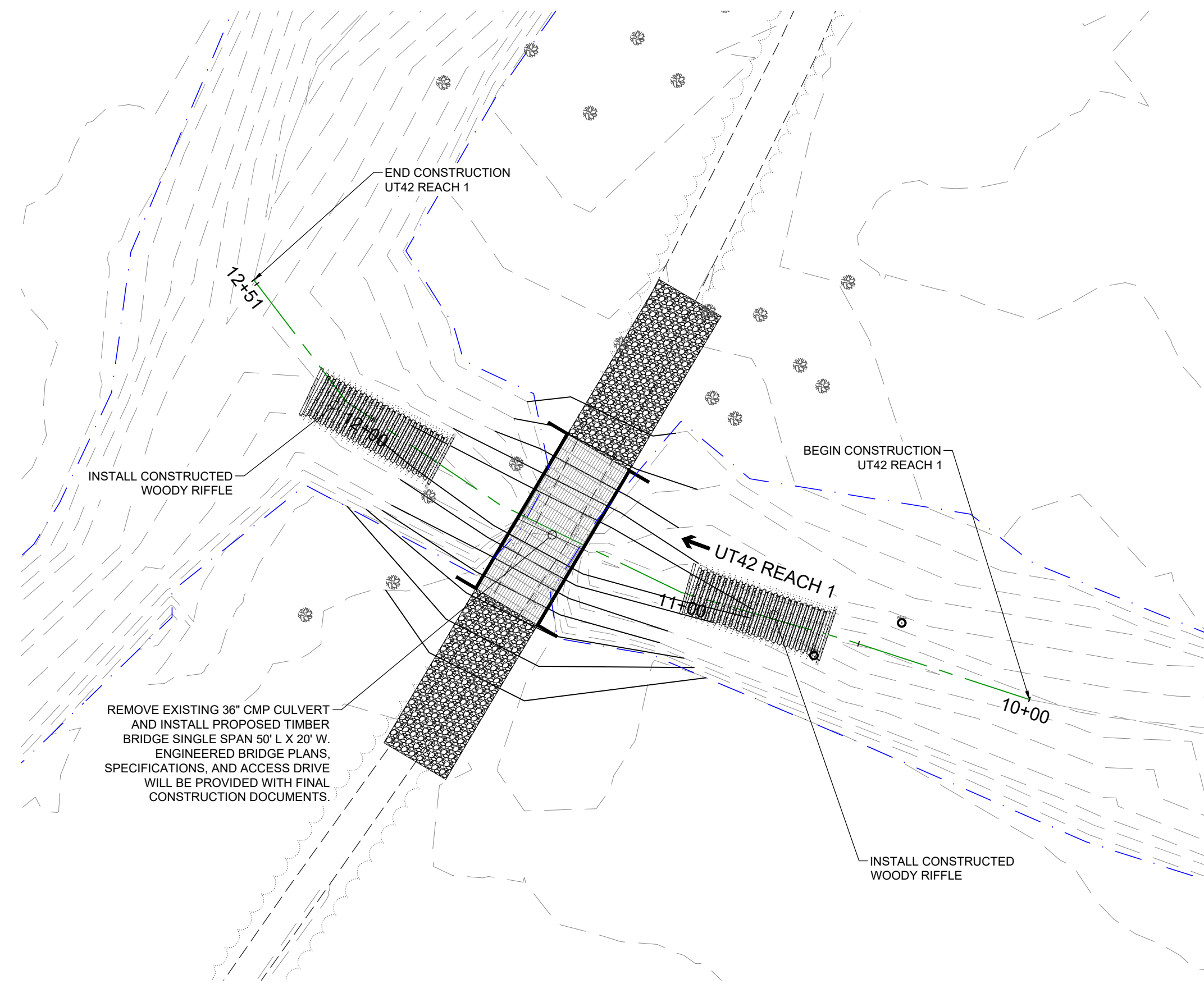
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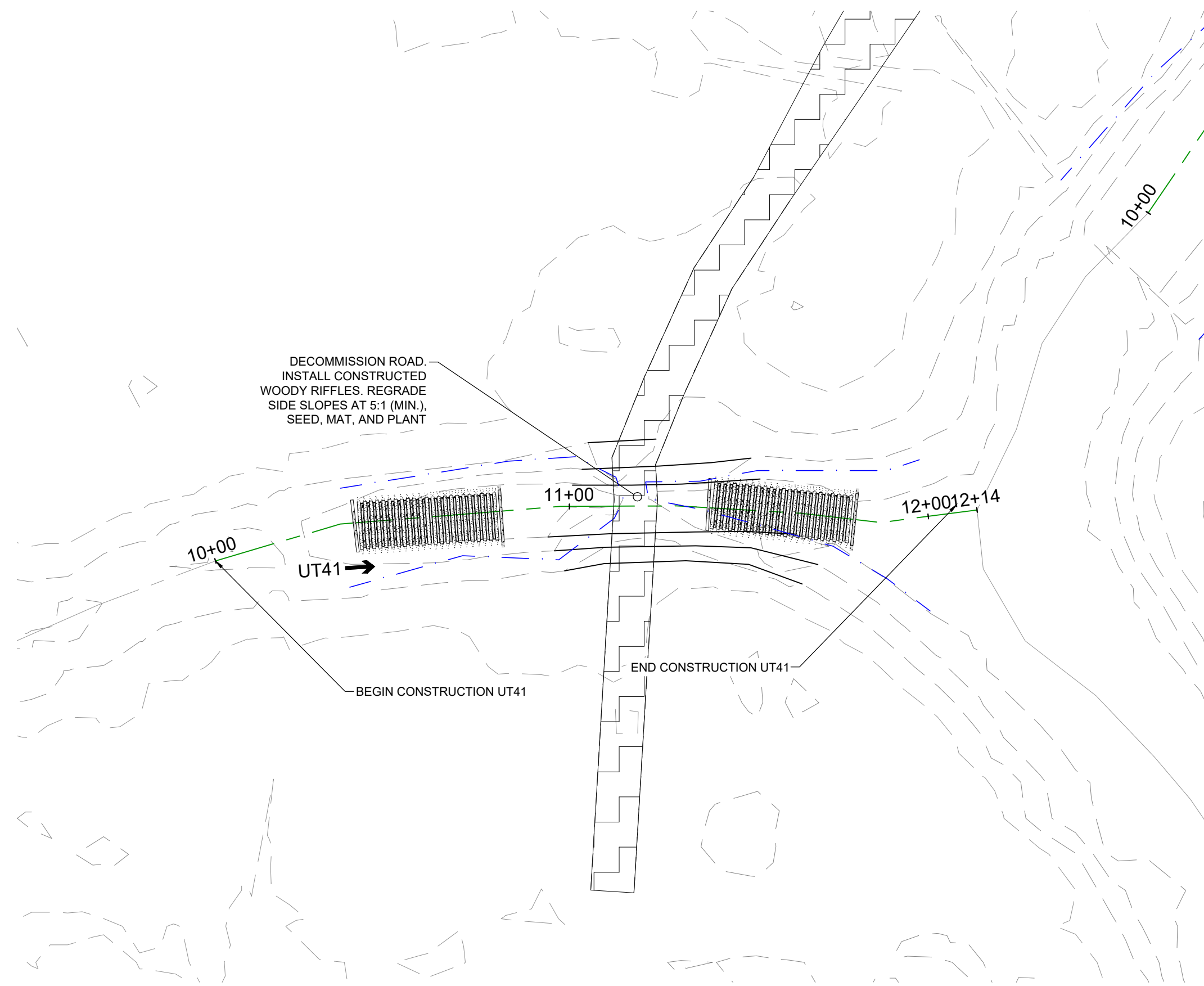
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ENLARGEMENT AREA B



ENLARGEMENT AREA C

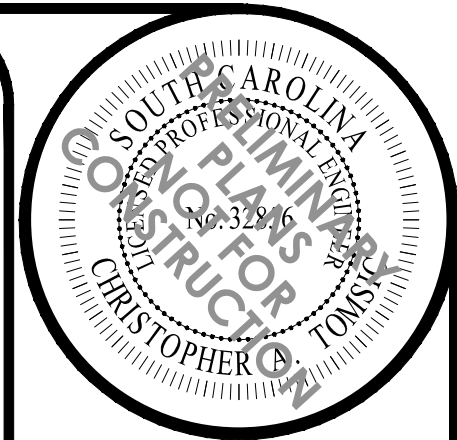


ENLARGEMENT AREA D

KEYMAP

SCALE IN MILES

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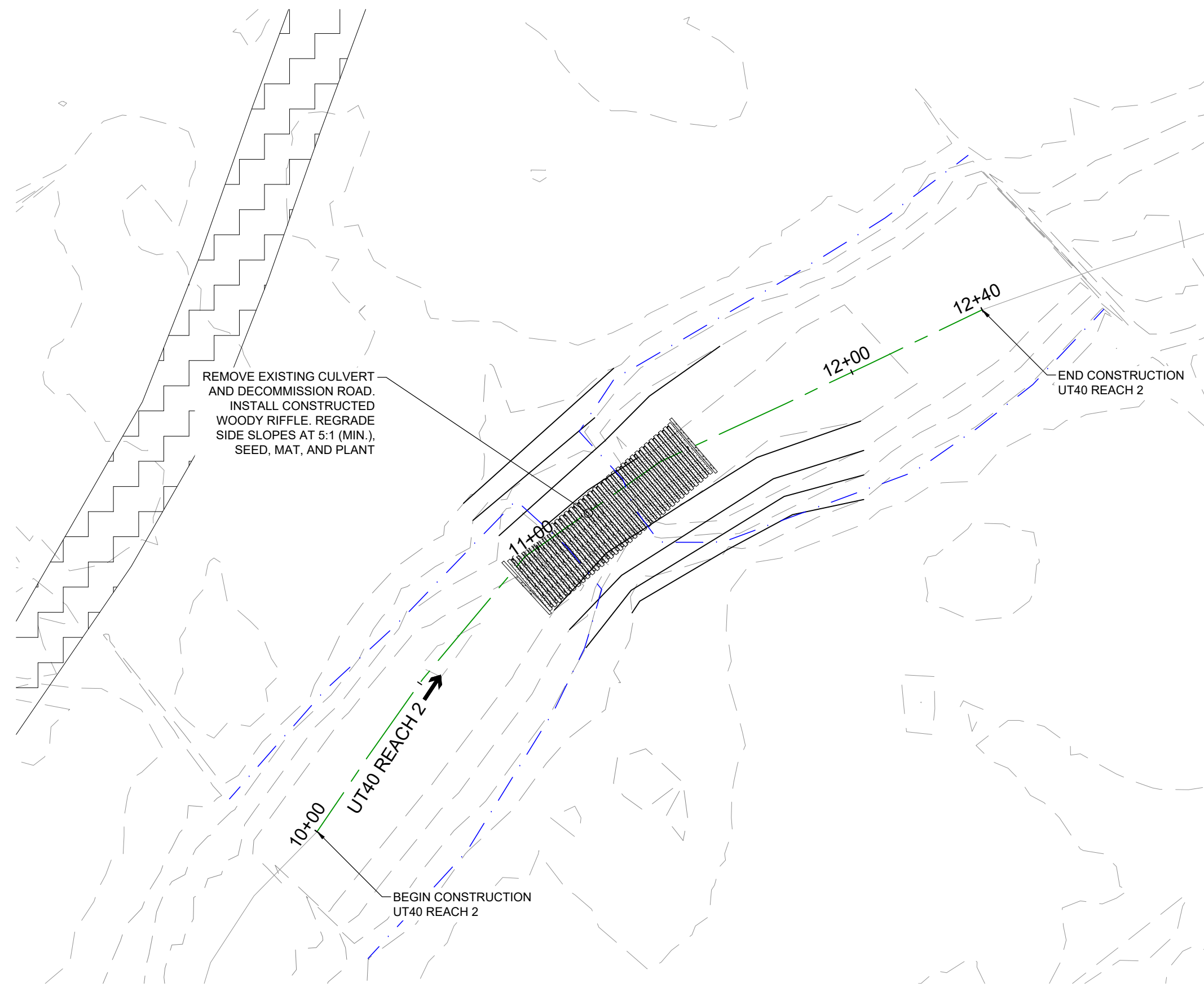
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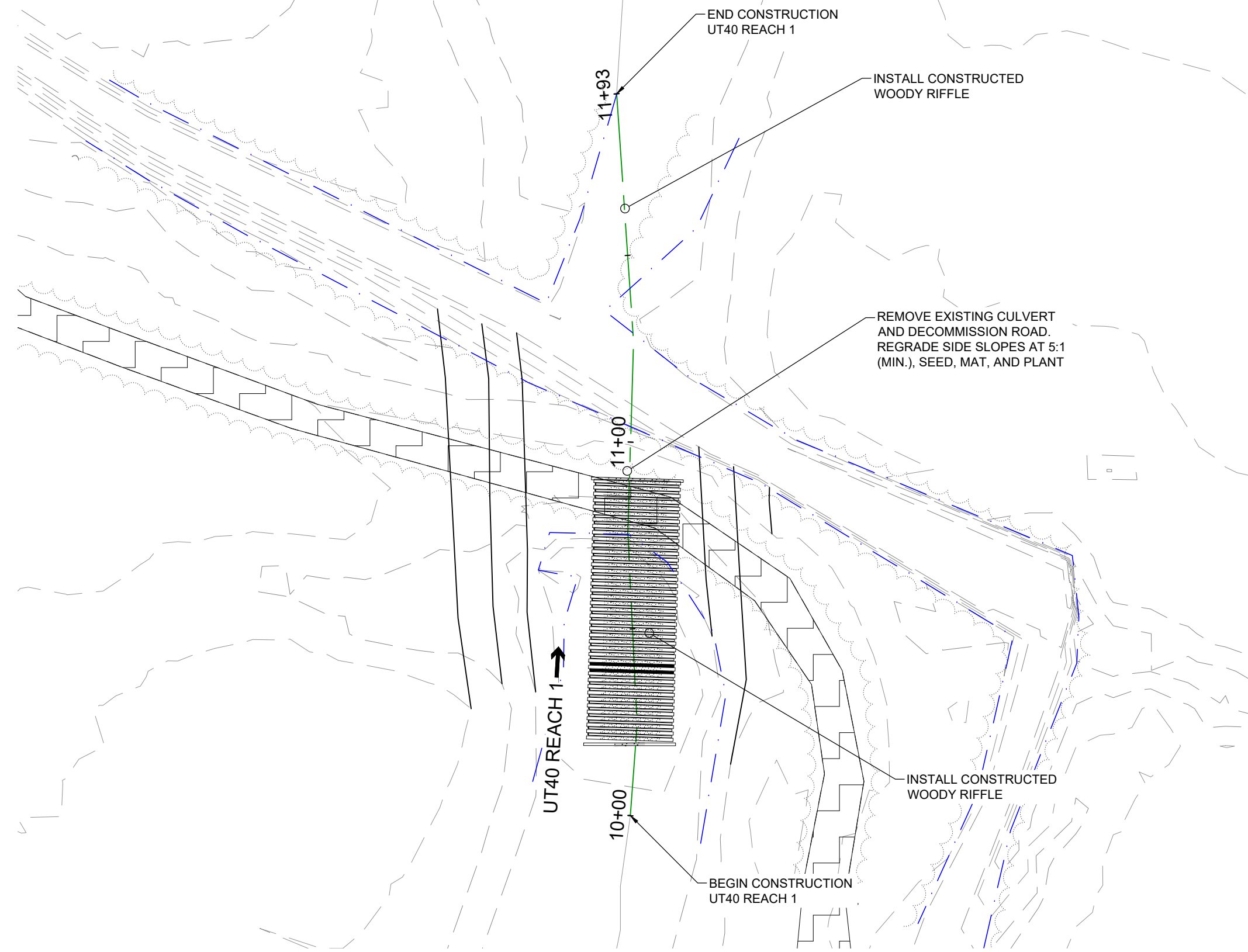
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 RICHLAND COUNTY, SOUTH CAROLINA

SHEET NAME  
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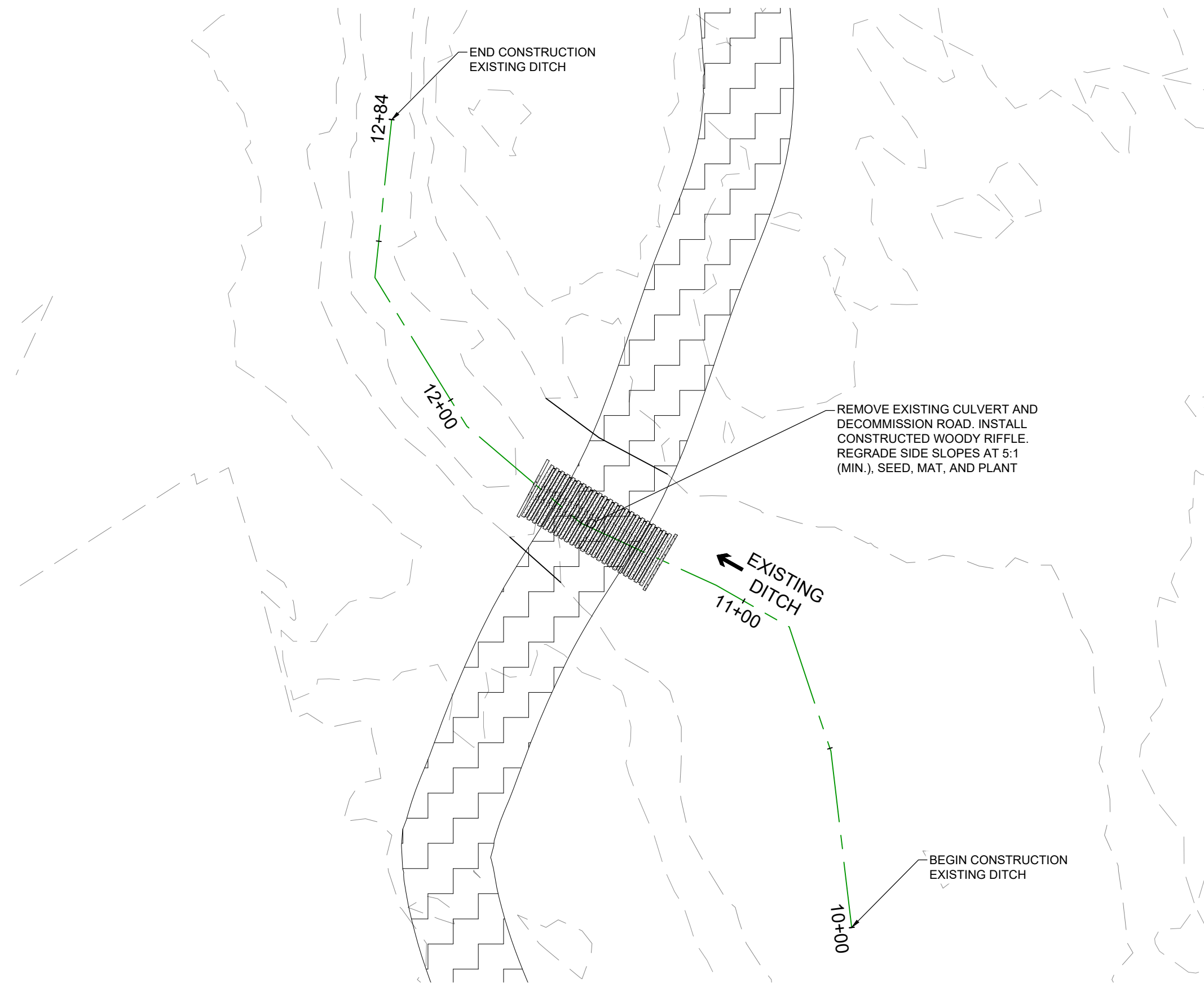




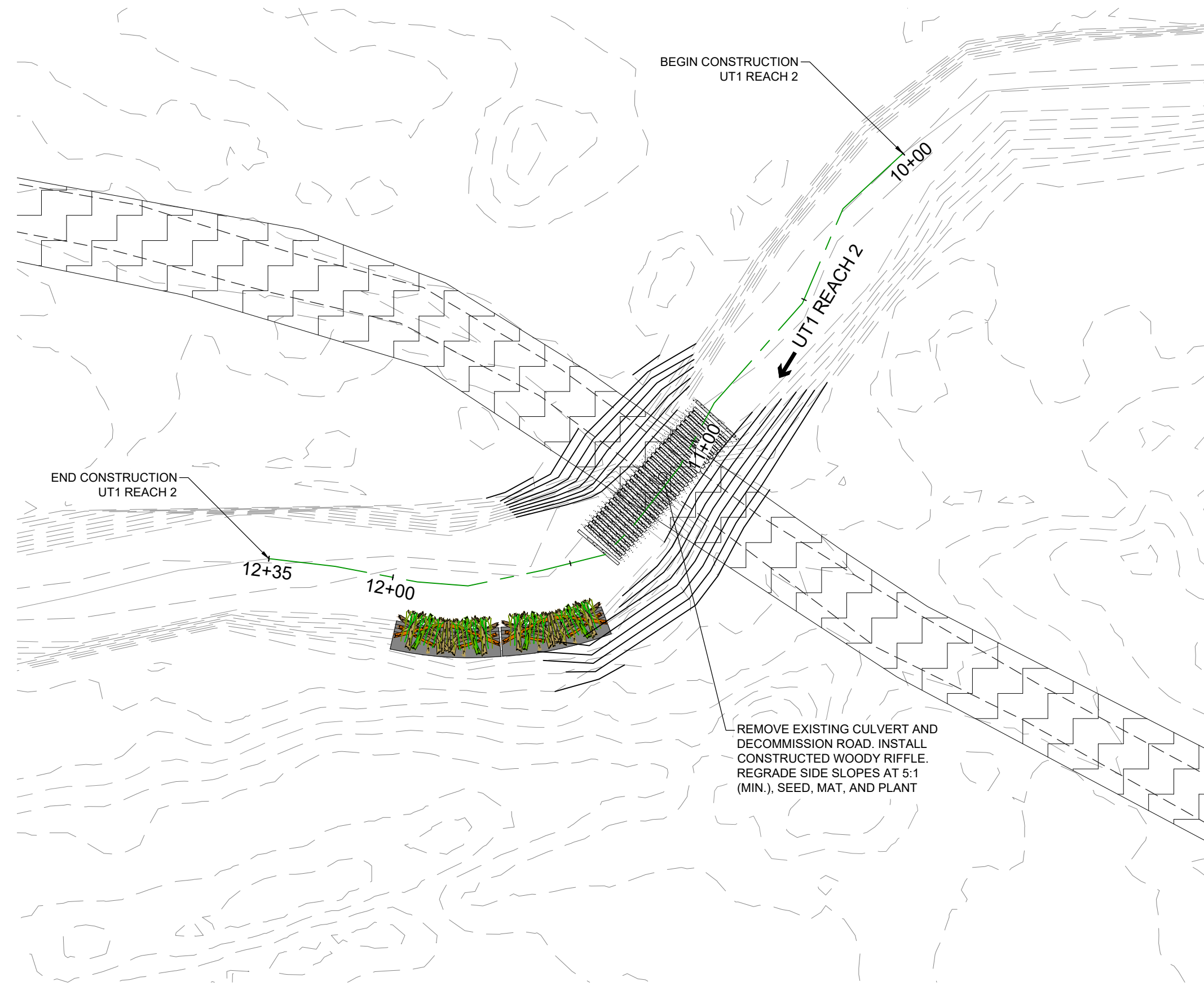
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ENLARGEMENT AREA F



ENLARGEMENT AREA G



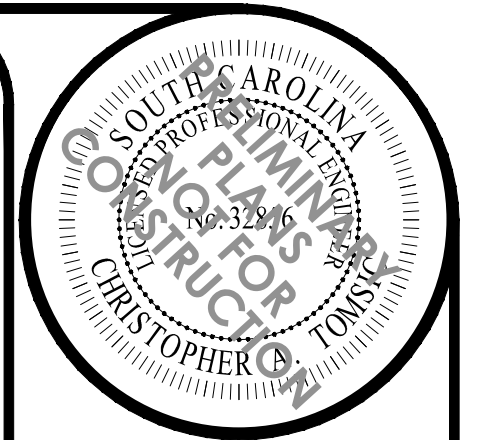
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KEYMAP

PROPERTY BOUNDARY

SCALE IN MILES

Permitted Plans



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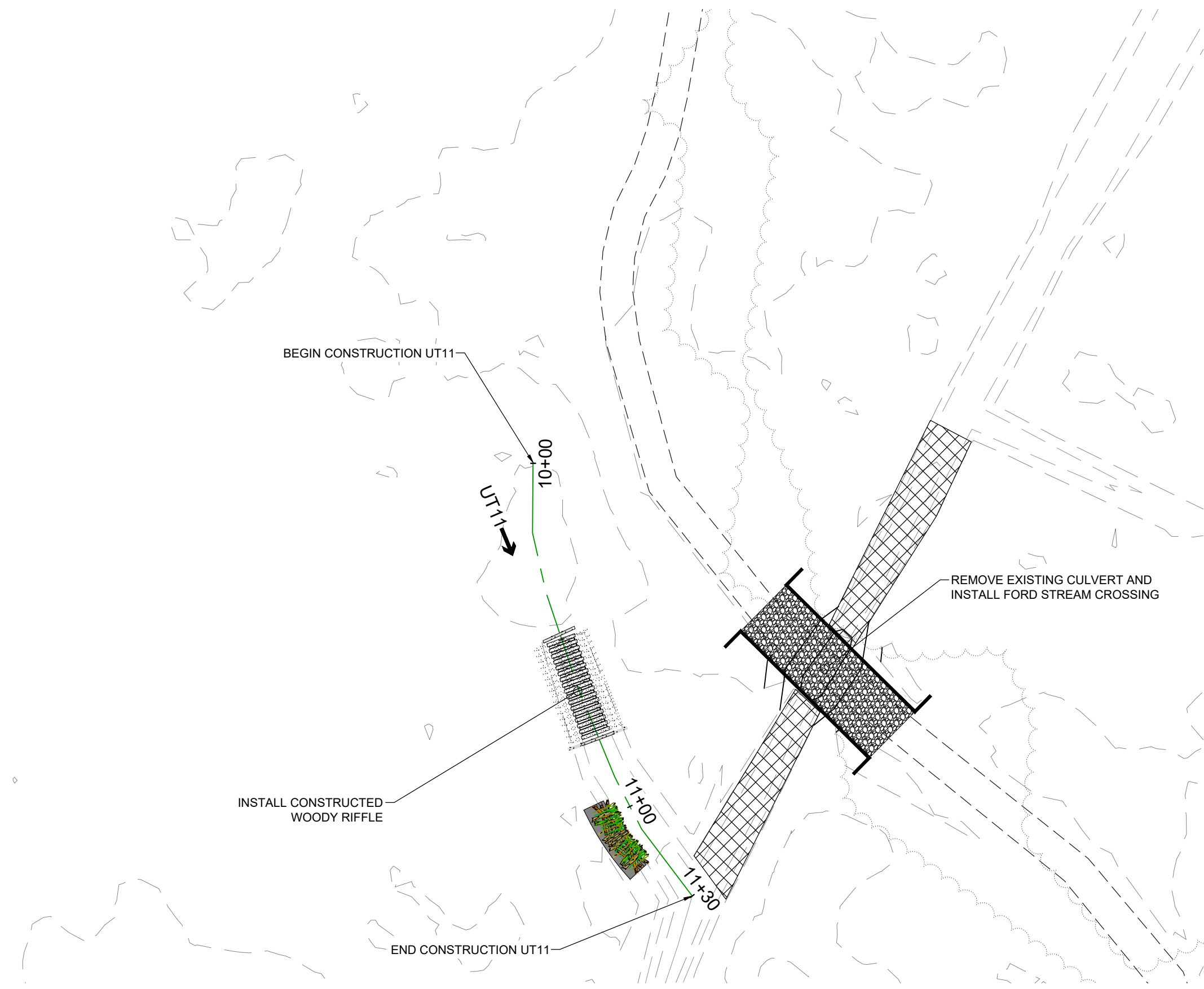
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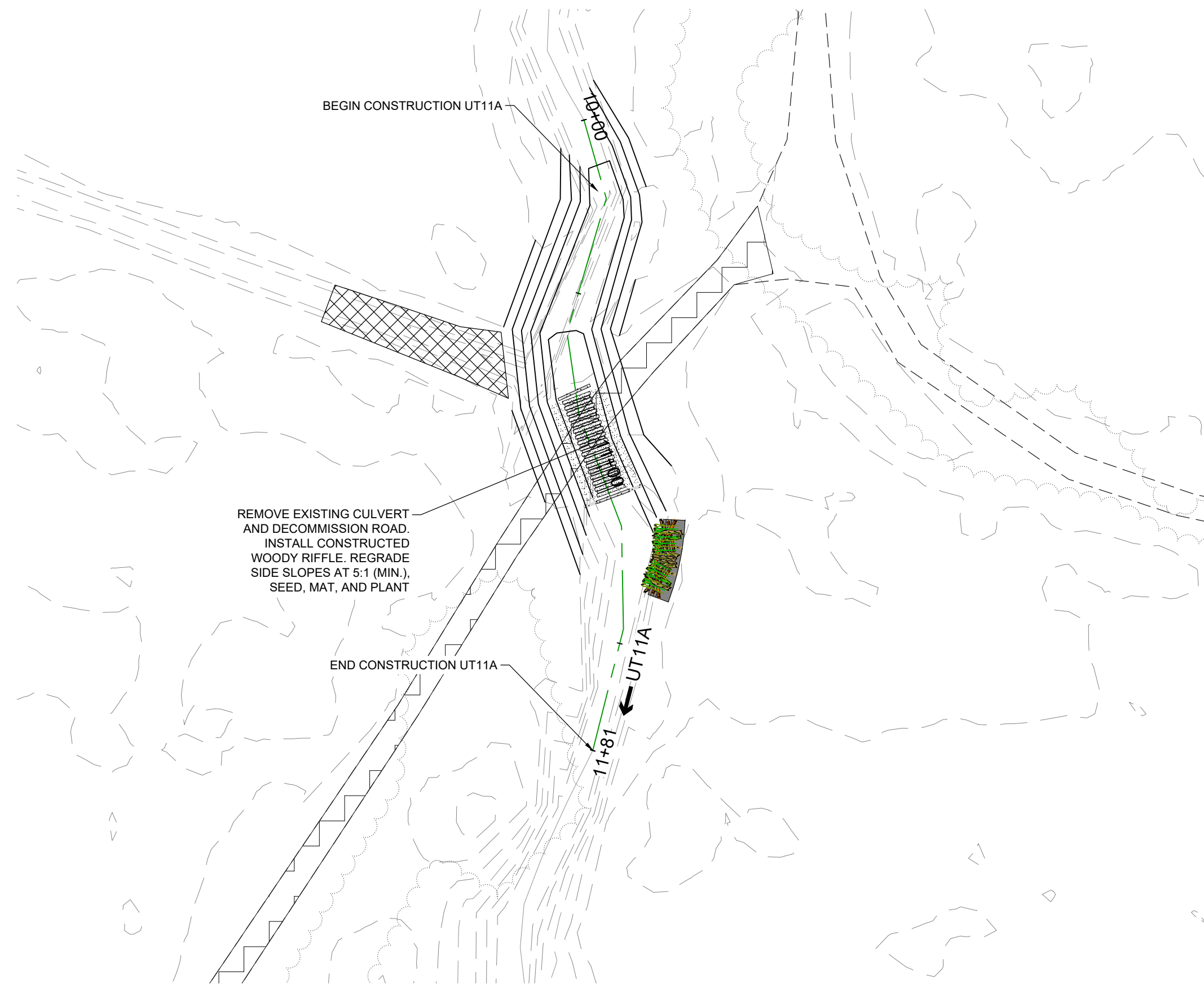
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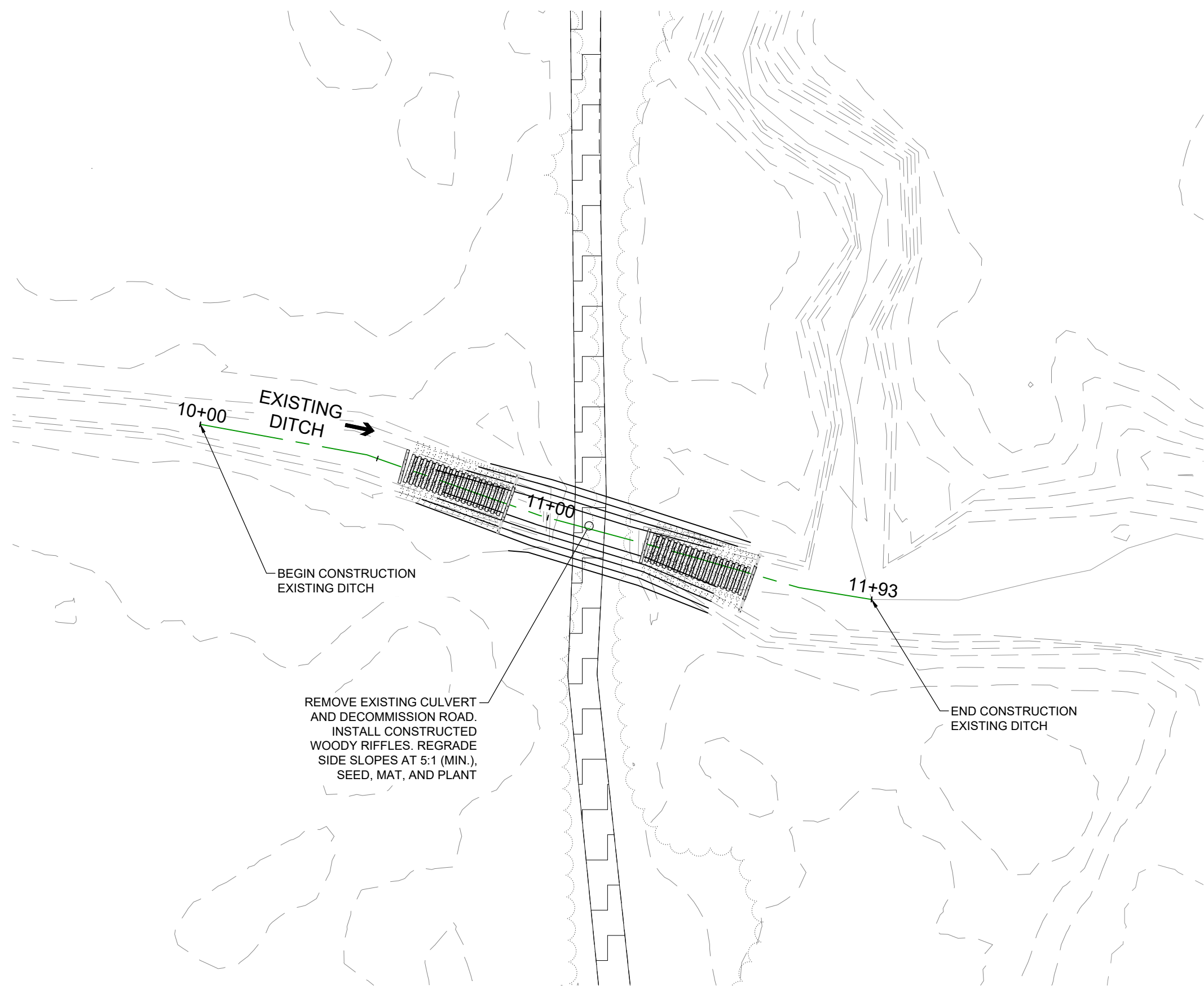
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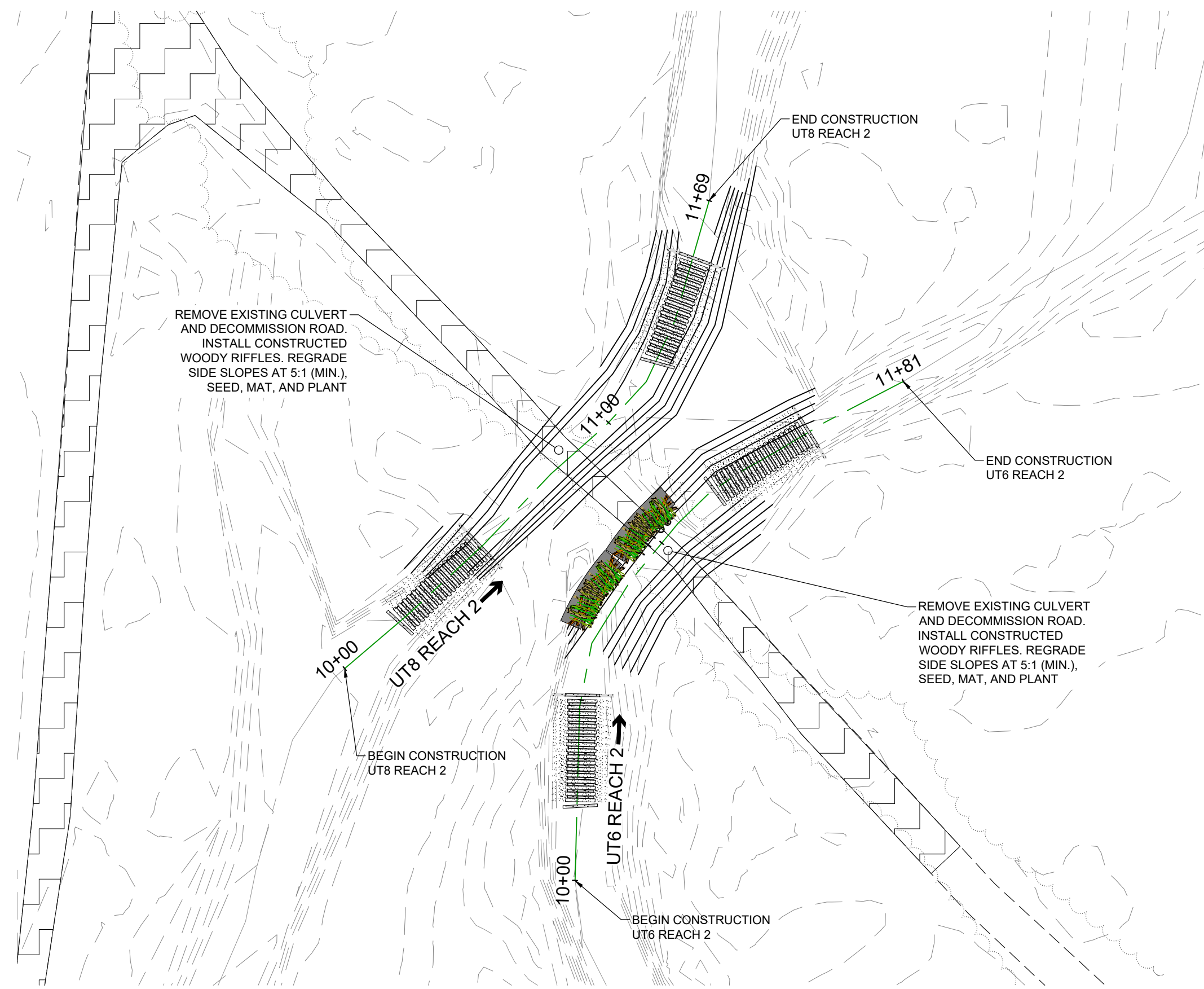
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HORIZONTAL SCALE IN FEET  
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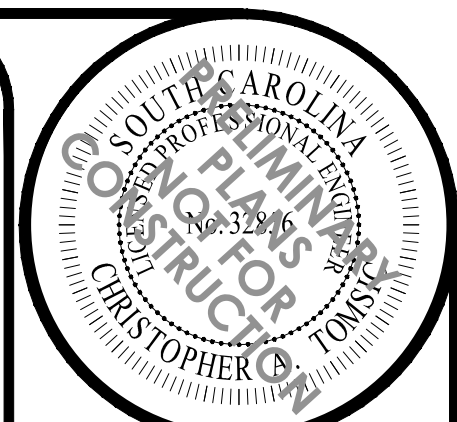
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 ENLARGEMENT AREA L

KEYMAP

PROPERTY BOUNDARY

SCALE IN MILES  
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Permitted Plans



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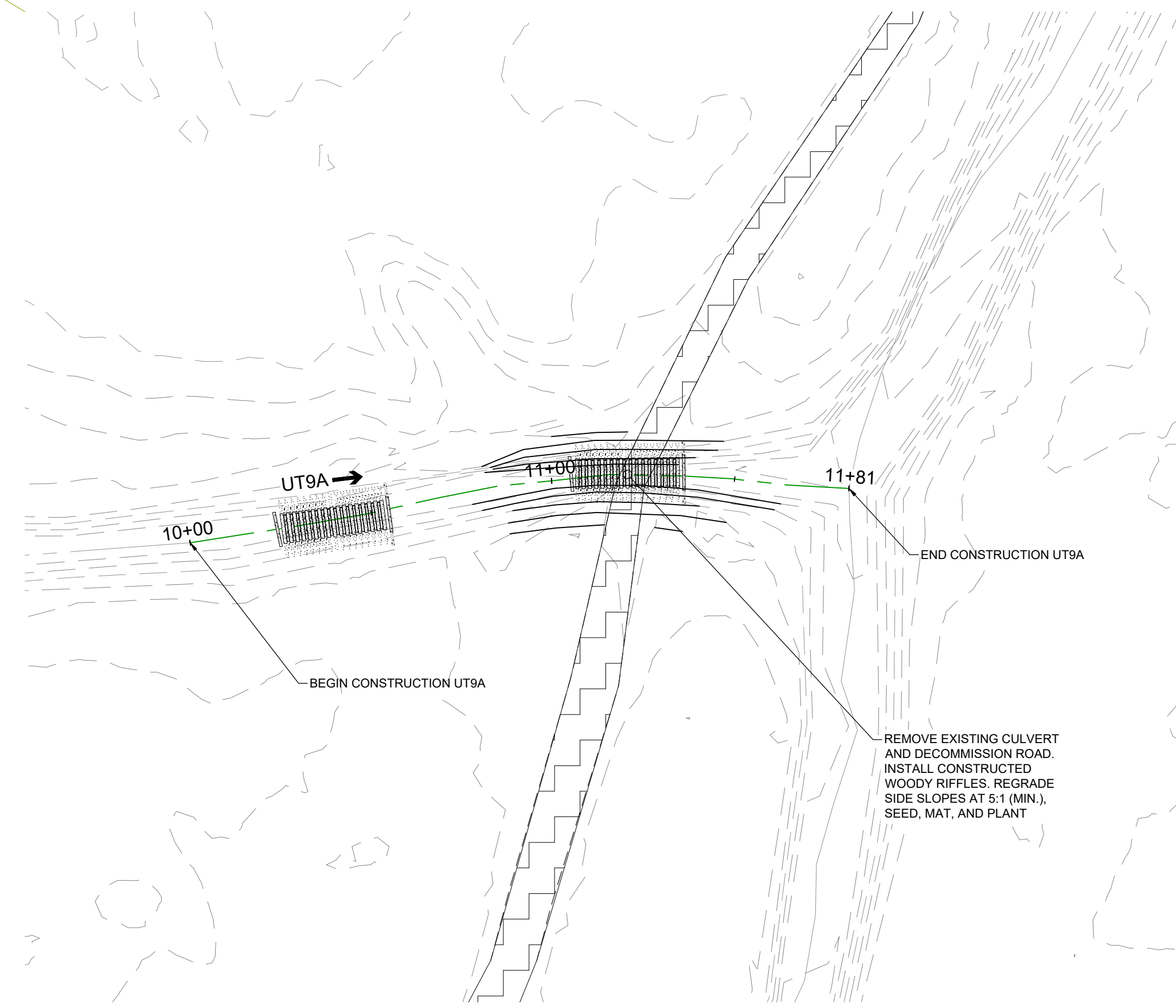
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 RICHLAND COUNTY, SOUTH CAROLINA

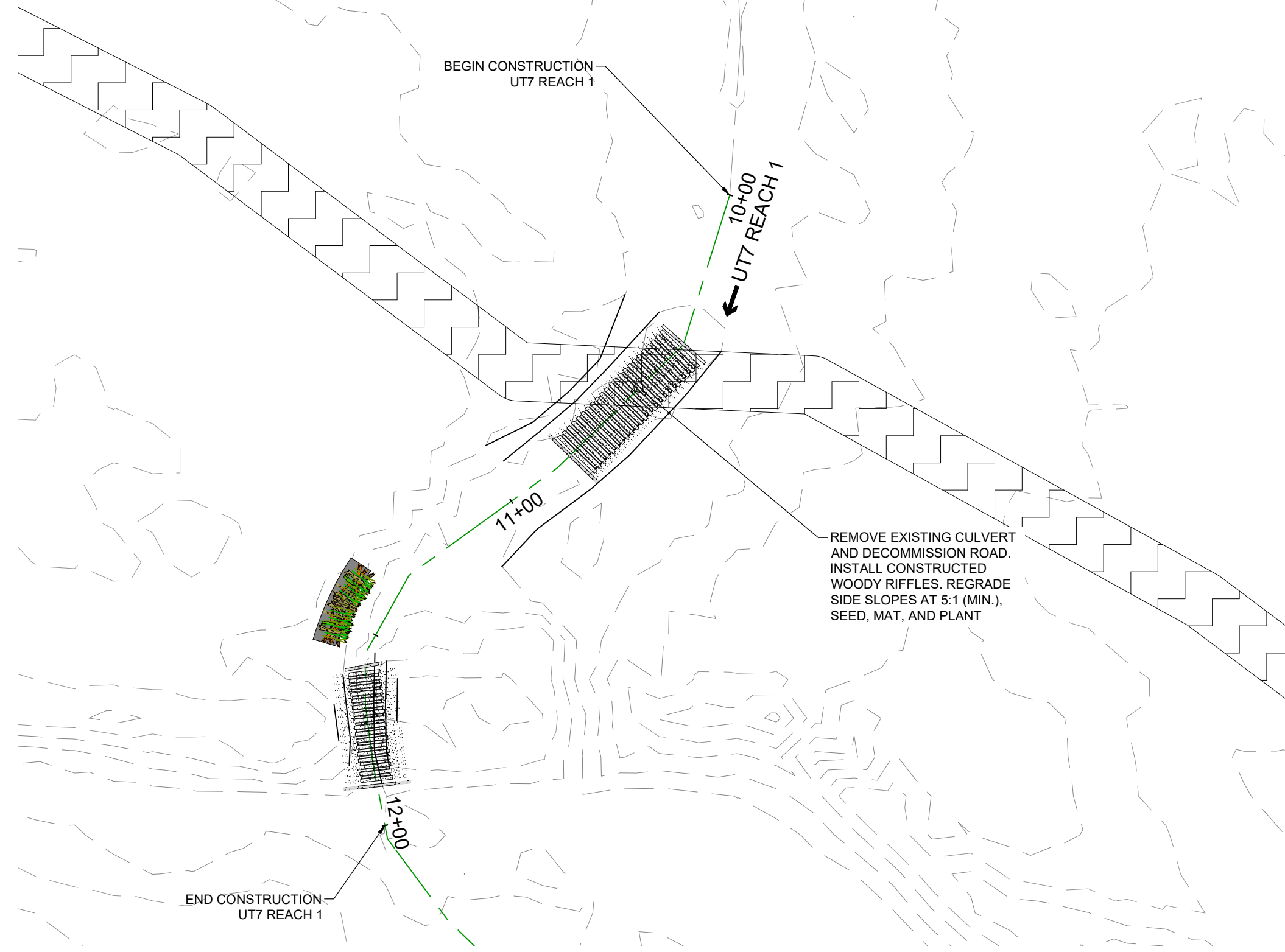
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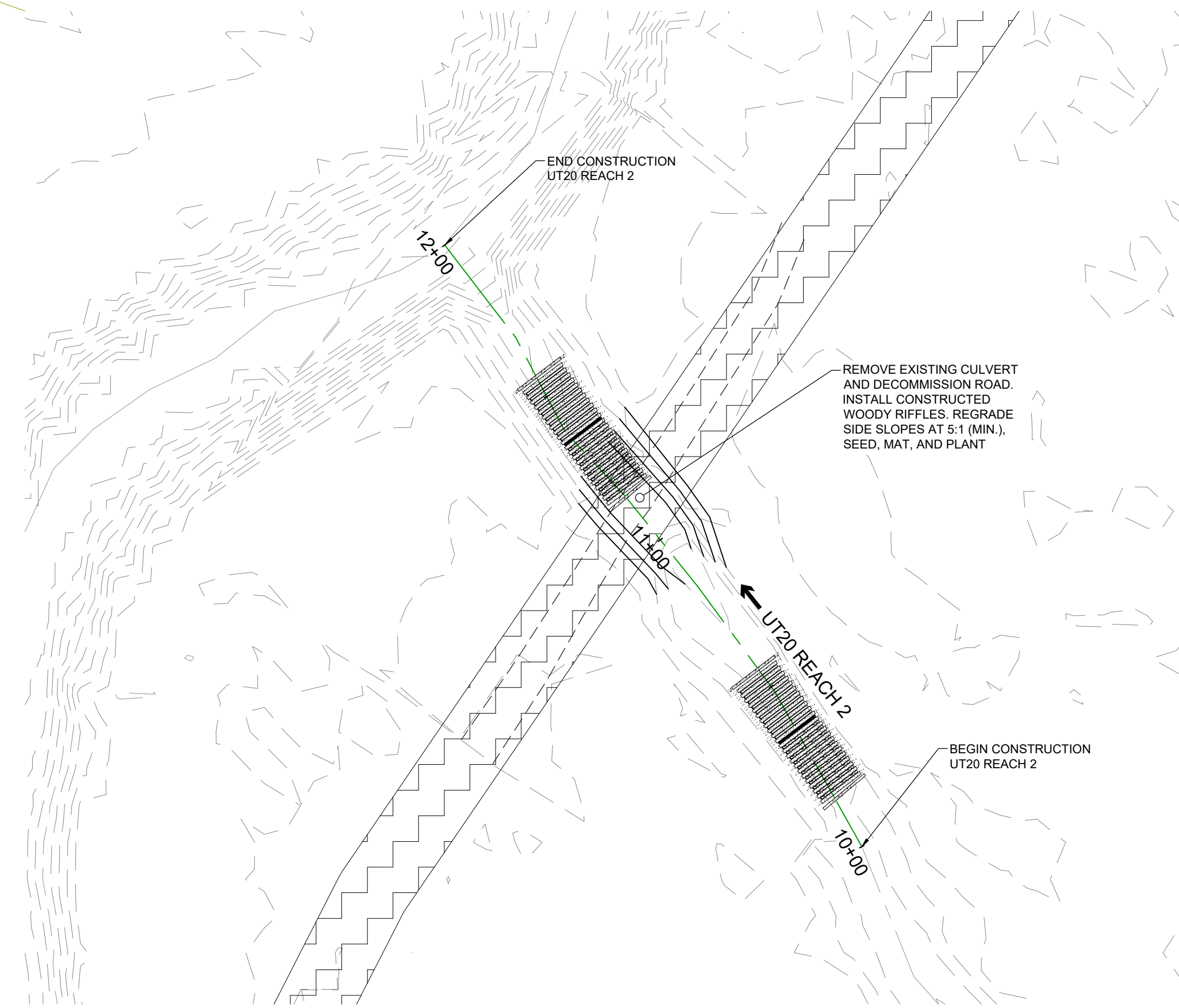
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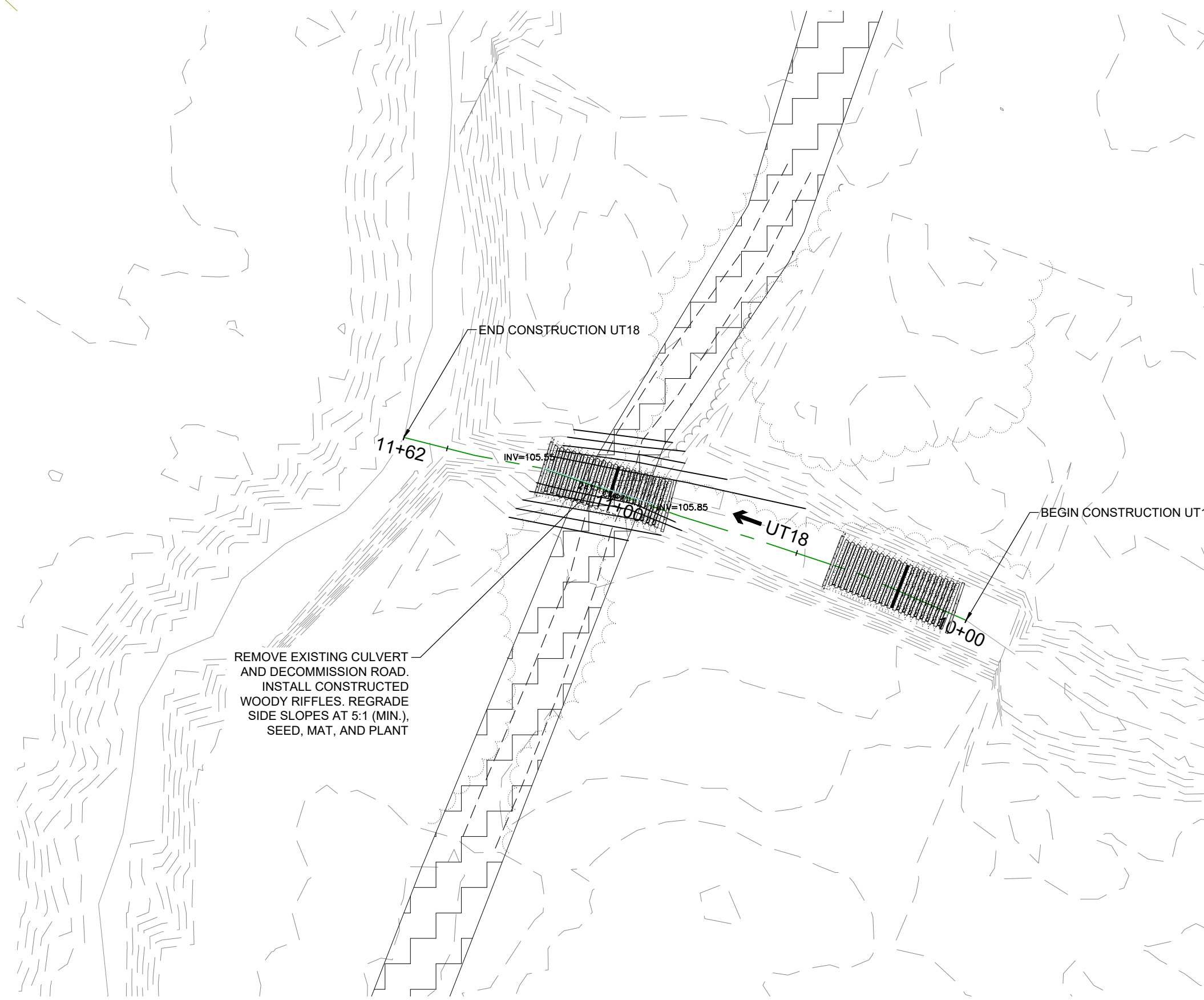
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**ENLARGEMENT AREA N**



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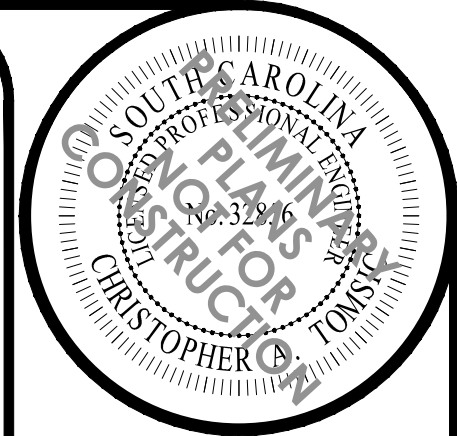
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KEYMAP

PROPERTY BOUNDARY

SCALE IN MILES

**Permitted Plans**



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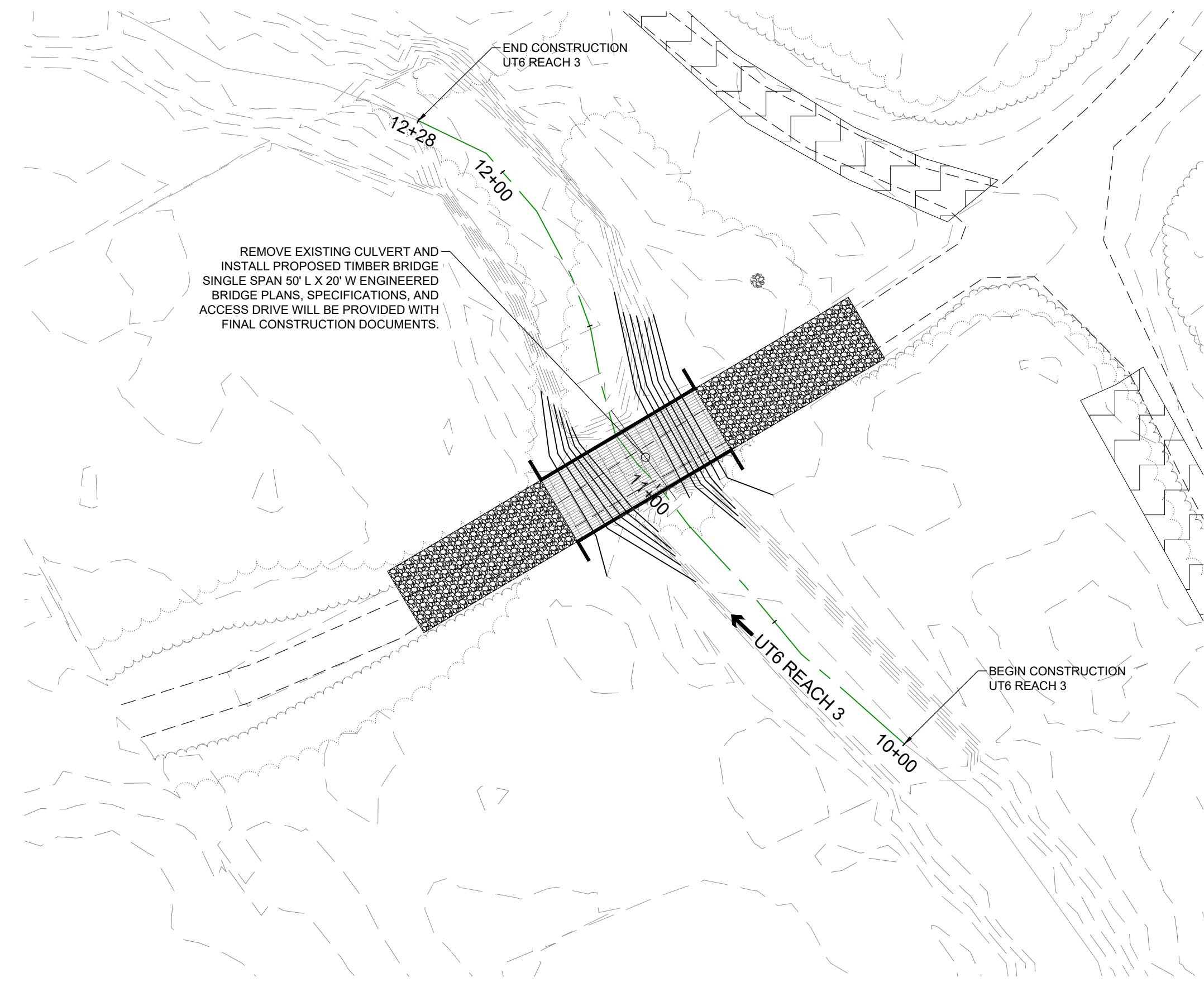
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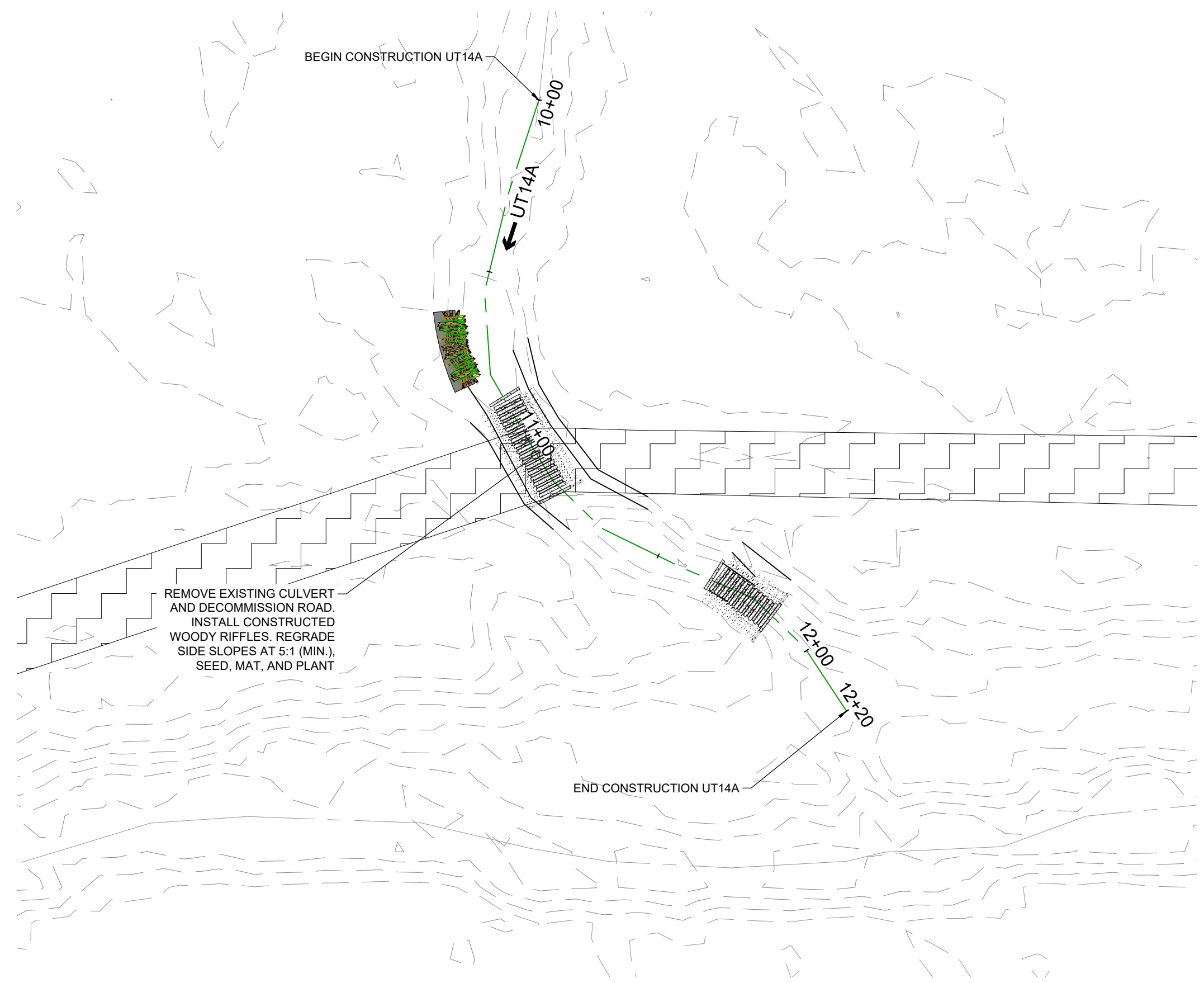
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 RICHLAND COUNTY, SOUTH CAROLINA

SHEET NAME  
**ENLARGEMENT AREAS M-P**

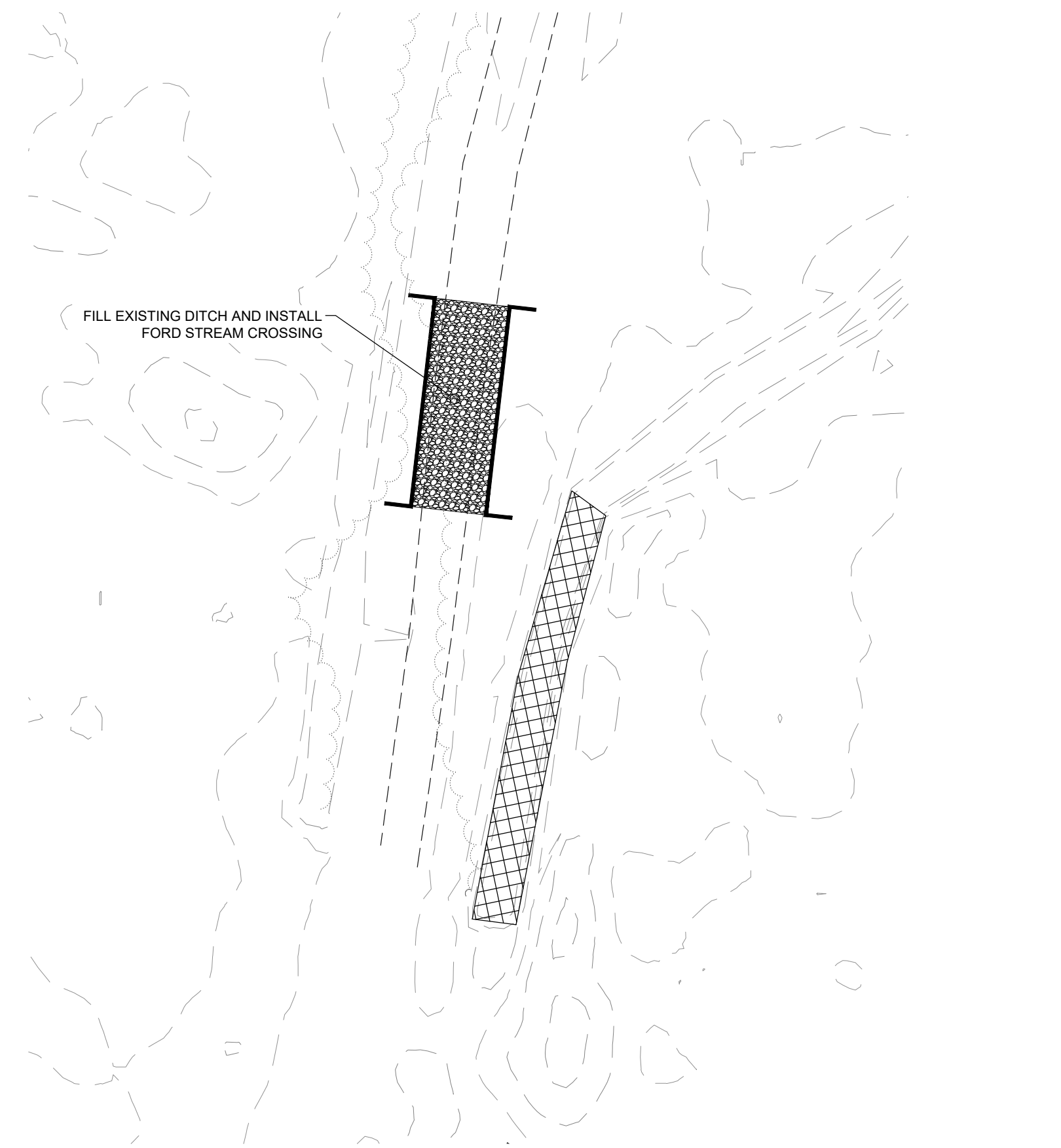




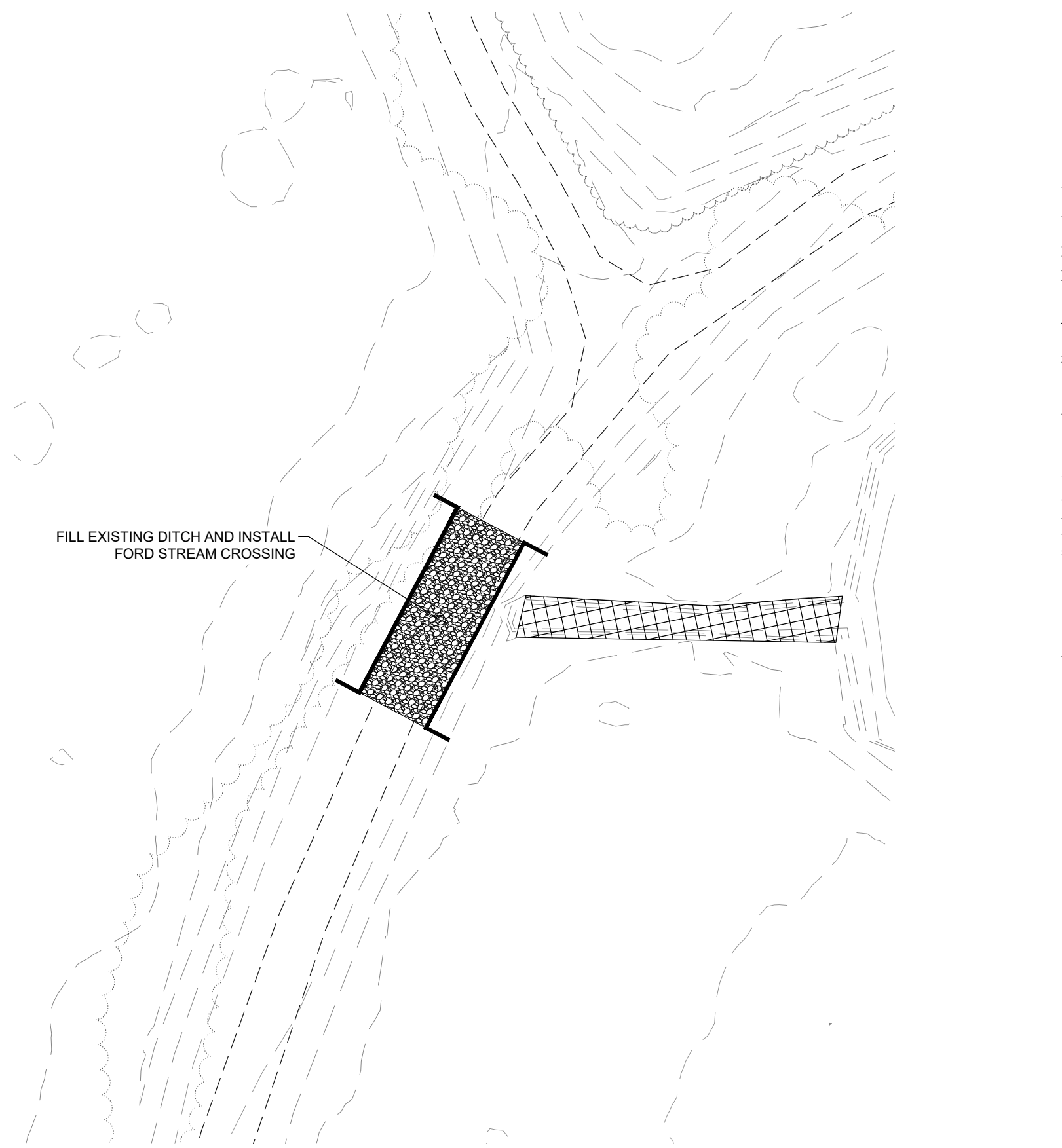
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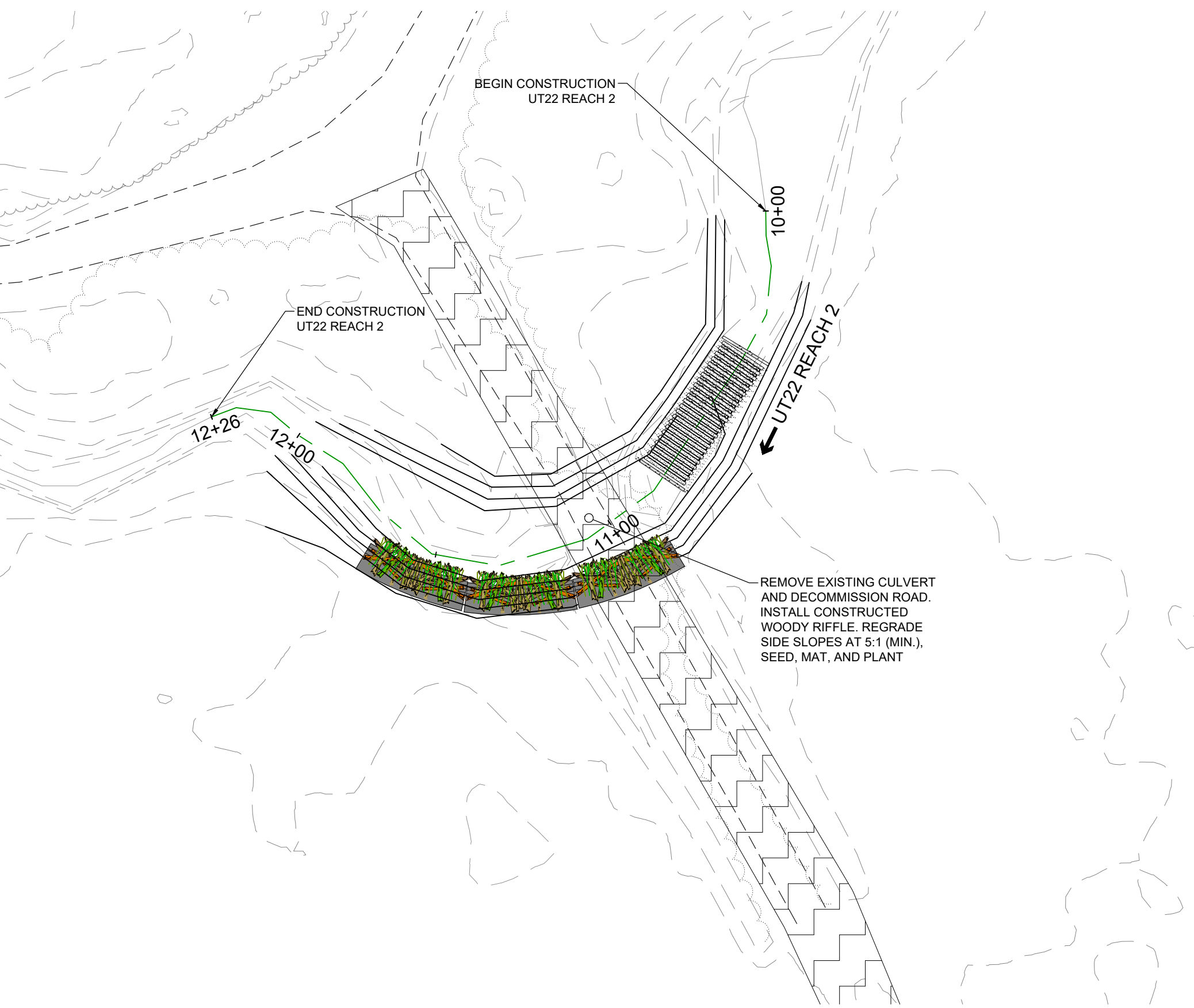
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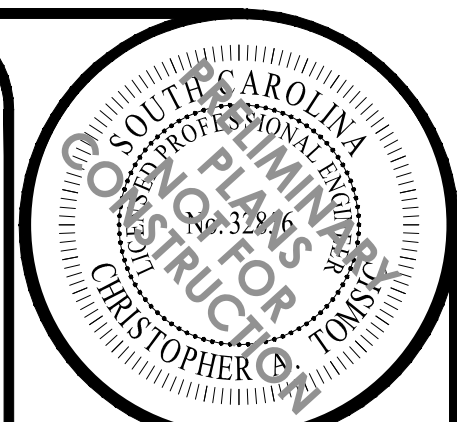


ENLARGEMENT AREA U

KEYMAP

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 RICHLAND COUNTY, SOUTH CAROLINA

SHEET NAME  
**ENLARGEMENT AREAS Q-T**

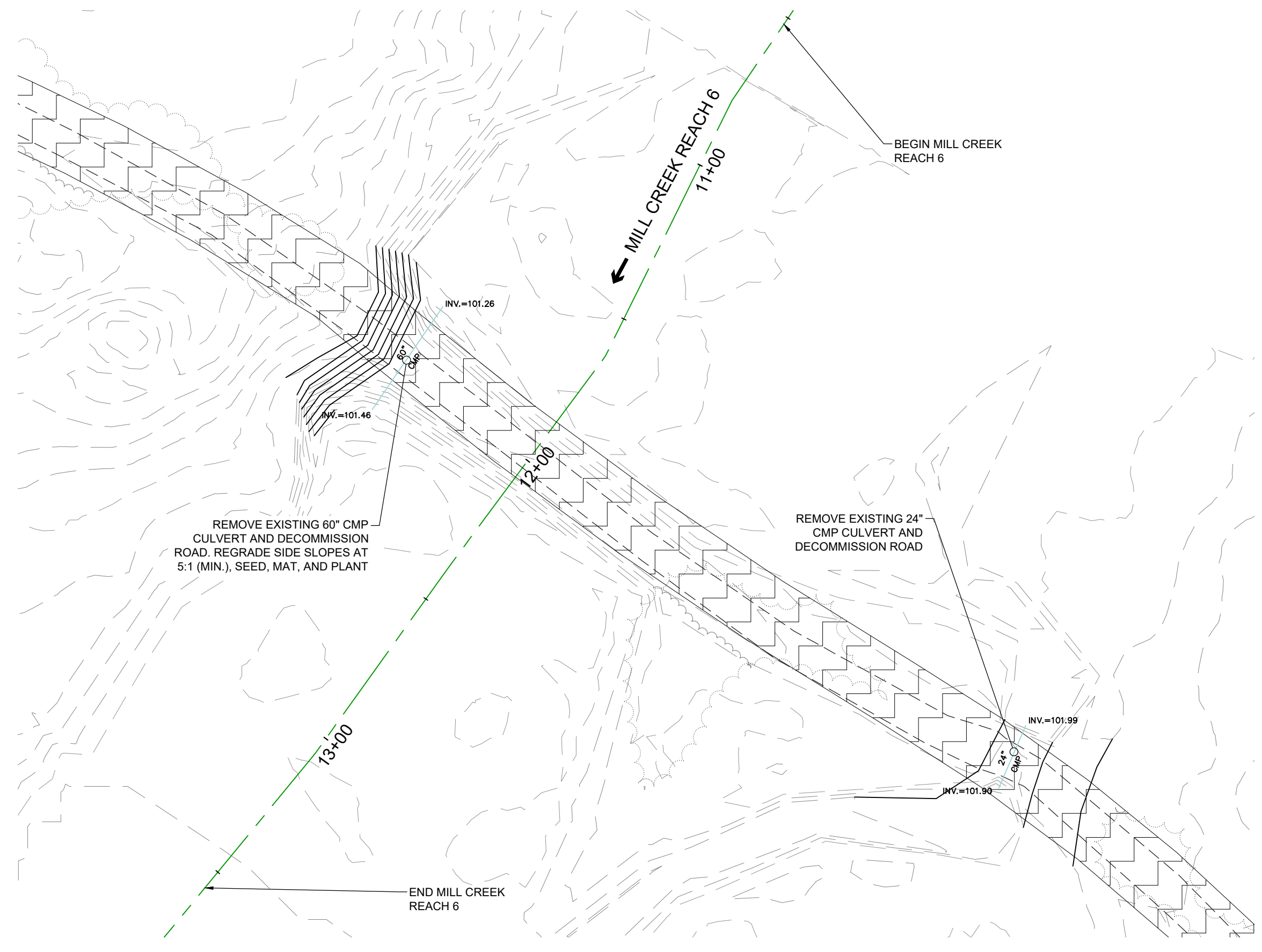




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ENLARGEMENT AREA W



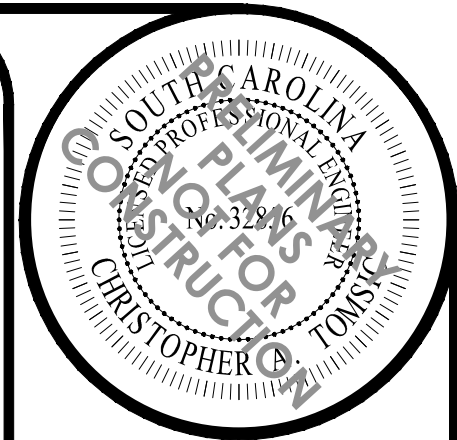
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KEYMAP

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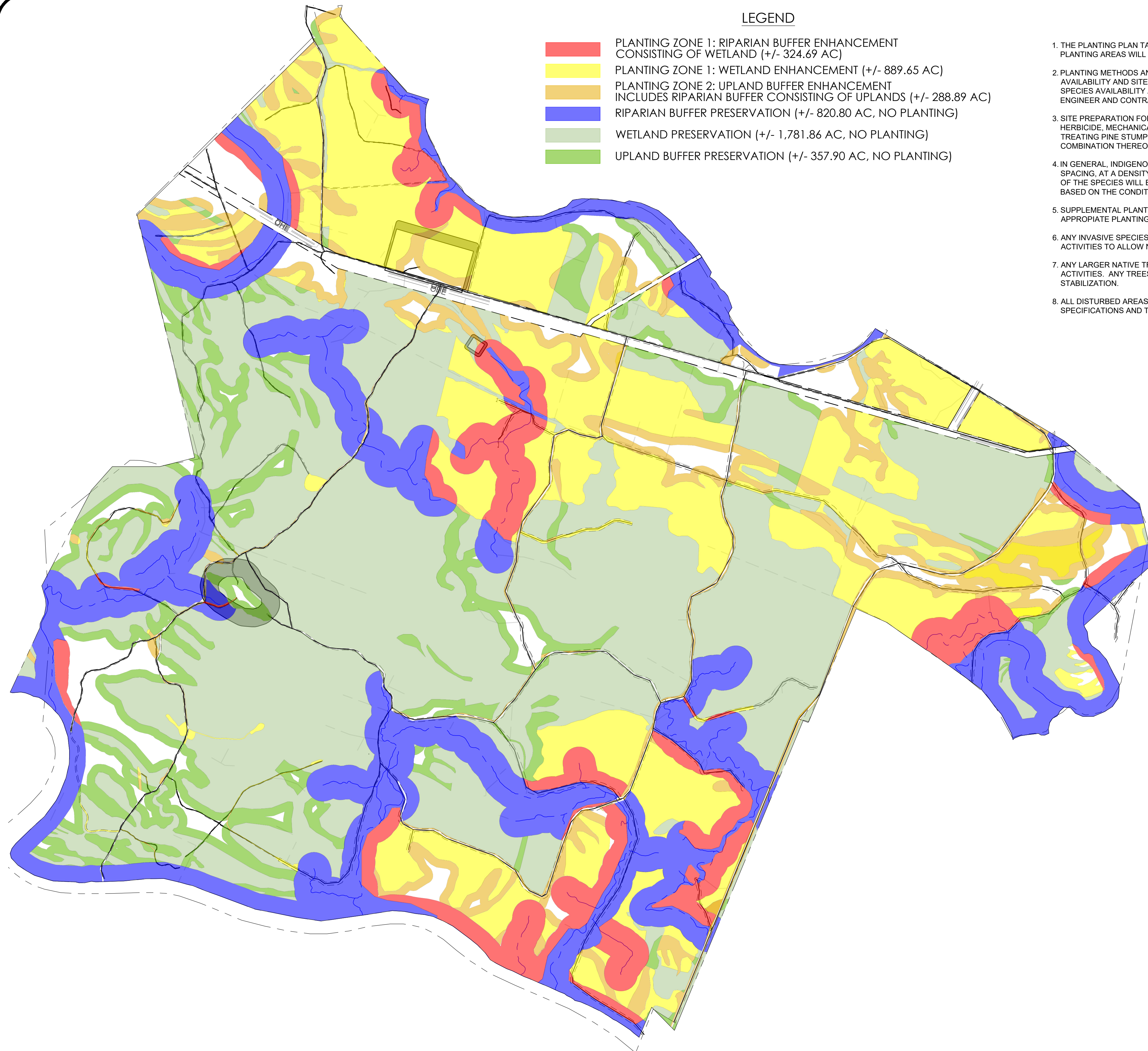
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SHEET NAME  
**ENLARGEMENT AREAS U-X**





**LEGEND**

- PLANTING ZONE 1: RIPARIAN BUFFER ENHANCEMENT CONSISTING OF WETLAND (+/- 324.69 AC)
- PLANTING ZONE 1: WETLAND ENHANCEMENT (+/- 889.65 AC)
- PLANTING ZONE 2: UPLAND BUFFER ENHANCEMENT INCLUDES RIPARIAN BUFFER CONSISTING OF UPLANDS (+/- 288.89 AC)
- RIPARIAN BUFFER PRESERVATION (+/- 820.80 AC, NO PLANTING)
- WETLAND PRESERVATION (+/- 1,781.86 AC, NO PLANTING)
- UPLAND BUFFER PRESERVATION (+/- 357.90 AC, NO PLANTING)

**PLANTING NOTES**

1. THE PLANTING PLAN TABLES LIST THE PROPOSED VEGETATION SPECIES SELECTION FOR THE PROJECT. THE TOTAL PLANTING AREAS WILL VARY BASED ON SITE CONDITIONS AND AREAS DISTURBED DURING CONSTRUCTION.
2. PLANTING METHODS AND PALETTES SHALL FOLLOW THE APPROVED MITIGATION PLAN AND BASED ON SPECIES AVAILABILITY AND SITE CONDITIONS. FINAL VEGETATION SPECIES SELECTION MAY CHANGE DUE TO REFINEMENT OR SPECIES AVAILABILITY AT THE TIME OF PLANTING. SPECIES SUBSTITUTIONS WILL BE COORDINATED BETWEEN THE ENGINEER AND CONTRACTOR PRIOR TO THE PROCUREMENT OF PLANT/SEED STOCK.
3. SITE PREPARATION FOR THE PROPOSED PLANTING AREAS MAY INCLUDE, BUT MAY NOT BE LIMITED TO, APPLYING HERBICIDE, MECHANICALLY REMOVING RAISED BEDS AND TROUGHS, SHEARING PINE STUMPS AT GROUND ELEVATION, TREATING PINE STUMPS AND LEAVING THEM IN PLACE, DRUM-CHOPPING, ROOT RAKING, TILLING, BURNING, OR ANY COMBINATION THEREOF TO MAXIMIZE SURVIVAL.
4. IN GENERAL, INDIGENOUS HARDWOOD SPECIES WILL BE PLANTED IN THEIR APPROPRIATE ZONE ON 10-FOOT X 10-FOOT SPACING, AT A DENSITY OF APPROXIMATELY 440 STEMS PER ACRE DURING THE DORMANT SEASON. EXACT PLACEMENT OF THE SPECIES WILL BE DETERMINED BY THE CONTRACTOR'S VEGETATION SPECIALIST PRIOR TO SITE PLANTING AND BASED ON THE CONDITIONS OF PLANTING LOCATIONS.
5. SUPPLEMENTAL PLANTING ACTIVITIES SHALL BE PERFORMED, AS NEEDED, USING NATIVE SPECIES VEGETATION IN THE APPROPRIATE PLANTING ZONE BASED ON THE SPECIFIED DENSITY AND PALETTE.
6. ANY INVASIVE SPECIES VEGETATION WILL BE TREATED AS DESCRIBED IN THE MITIGATION PLAN PRIOR TO PLANTING ACTIVITIES TO ALLOW NATIVE PLANTS TO BECOME ESTABLISHED WITHIN THE PROJECT BOUNDARY.
7. ANY LARGER NATIVE TREE SPECIES TO BE PRESERVED WILL BE FLAGGED BY THE ENGINEER PRIOR TO CONSTRUCTION ACTIVITIES. ANY TREES HARVESTED FOR WOODY MATERIAL WILL BE UTILIZED TO PROVIDE IN-STREAM HABITAT AND STABILIZATION.
8. ALL DISTURBED AREAS WILL BE STABILIZED USING MULCHING AND SEEDING AS DEFINED IN THE CONSTRUCTION SPECIFICATIONS AND THE APPROVED STORMWATER POLLUTION AND PREVENTION PLAN.

PLANTING ZONE 1: Riparian Buffer/Wetland Hardwood Planting (10' X 10' Spacing - 440 stems/acre)			
COMMON NAME	SCIENTIFIC NAME	PERCENT BY SPECIES	INDICATOR STATUS
River Birch	<i>Betula nigra</i>	5%	FACW
American Sycamore	<i>Platanus occidentalis</i>	5%	FACW
Laurel Oak	<i>Quercus laurifolia</i>	10%	FACW
Water Oak	<i>Quercus nigra</i>	10%	FAC
Swamp Chestnut Oak	<i>Quercus michauxii</i>	10%	FACW
Cherrybark Oak	<i>Quercus pagoda</i>	10%	FACW
Willow Oak	<i>Quercus phellos</i>	10%	FACW
Sugarberry	<i>Celtis laevigata</i>	10%	FACW
Swamp Black Gum	<i>Nyssa biflora</i>	10%	OBL
Bald Cypress	<i>Taxodium distichum</i>	10%	OBL
Green Ash	<i>Fraxinus pennsylvanica</i>	5%	FACW
American Hornbeam	<i>Carpinus caroliniana</i>	5%	FAC

PLANTING ZONE 2: Upland Hardwood Planting (10' X 10' Spacing - 440 stems/acre)			
COMMON NAME	SCIENTIFIC NAME	PERCENT BY SPECIES	INDICATOR STATUS
Northern White Oak	<i>Quercus alba</i>	10%	FACU
Water Oak	<i>Quercus nigra</i>	10%	FAC
American Sycamore	<i>Platanus occidentalis</i>	10%	FACW
Yellow Poplar	<i>Liriodendron tulipifera</i>	10%	FACU
River Birch	<i>Betula nigra</i>	10%	FACW
Cottonwood	<i>Populus deltoides</i>	10%	FAC
Persimmon	<i>Diospyros virginiana</i>	10%	FAC
Flowering Dogwood	<i>Cornus florida</i>	10%	FACU
Black Cherry	<i>Prunus serotina</i>	10%	FACU
American Hornbeam	<i>Carpinus caroliniana</i>	10%	FAC

PLANTING ZONE 3: Ditch Plug Seeding			
COMMON NAME	SCIENTIFIC NAME	PERCENT BY SPECIES	INDICATOR STATUS
Winter Bentgrass	<i>Agrostis hyemalis</i>	1.0%	
Southeastern Wild Rye	<i>Elymus glaberrimus</i>	20.0%	
Deertongue	<i>Panicum clandestinum</i>	11.0%	
Redtop Panicgrass	<i>Panicum rigidulum</i>	15.6%	
Blackeyed Susan	<i>Rudbeckia hirta</i>	3.0%	
New York Ironweed	<i>Vernonia noveboracensis</i>	0.5%	
Purplehead Sneezeweed	<i>Helianthus flexuosus</i>	0.7%	
Mistflower	<i>Eupatorium coelestinum</i>	0.7%	
Swamp Sunflower	<i>Helianthus angustifolius</i>	2.0%	
Fox sedge	<i>Carex vulpinoidea</i>	17.0%	
Big Bluestem	<i>Andropogon gerardii</i>	17.0%	
River Oats	<i>Chasmanthium latifolium</i>	7.0%	
Slender Woodoats	<i>Chasmanthium laxum</i>	1.0%	
Partridge Pea	<i>Chamaecrista fasciculata</i>	2.5%	
Sensitive Pea	<i>Chamaecrista nictitans</i>	1.0%	

PLANTING ZONE 4: STREAMBANK SEEDING			
COMMON NAME	SCIENTIFIC NAME	PERCENT BY SPECIES	INDICATOR STATUS
River Oats	<i>Chasmanthium latifolium</i>	25%	
Beaked Panicgrass	<i>Panicum anceps</i>	21%	
Southeastern Wildrye	<i>Elymus glaberrimus</i>	20%	
Redtop Panicgrass	<i>Panicum rigidulum</i>	20%	
Winter Bentgrass	<i>Agrostis hyemalis</i>	5%	
Partridge Pea	<i>Chamaecrista fasciculata</i>	5%	
Leathery Rush	<i>Juncus coriaceus</i>	3%	
New York Ironweed	<i>Vernonia noveboracensis</i>	1%	

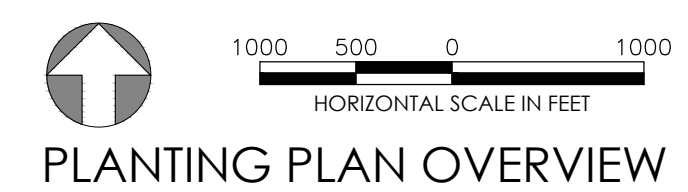
**STREAMBANKS (Live Stakes)**  
Live stakes shall be applied to all graded and/or disturbed streambanks spaced 3 foot on center or as specified.

COMMON NAME	SCIENTIFIC NAME	PERCENT BY SPECIES
Stiff Dogwood	<i>Cornus foemina</i>	20%
Black Willow	<i>Salix nigra</i>	60%
Spice Bush	<i>Lindera benzoin</i>	10%
Button Bush	<i>Cephalanthus occidentalis</i>	10%

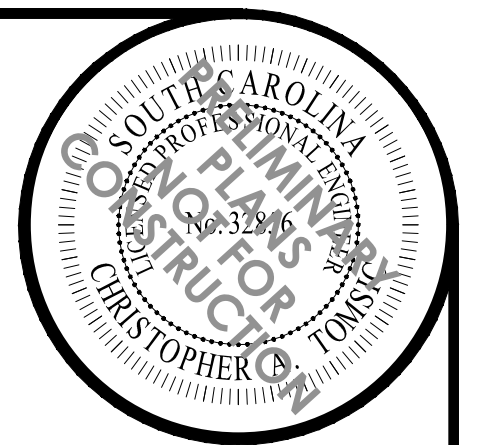
  

**TEMPORARY SEEDING**  
All disturbed areas shall be stabilized using mulch and seed according to the technical specifications.

COMMON NAME	RATE	DATES
Annual Rye	20 LBS/ACRE	SEPTEMBER TO MARCH (COOL SEASON)
Browntop Millet	10 LBS/ACRE	APRIL TO AUGUST (WARM SEASON)



PLANTING PLAN OVERVIEW



NO.	DESCRIPTION	DATE
1	FMP	11/30/2023

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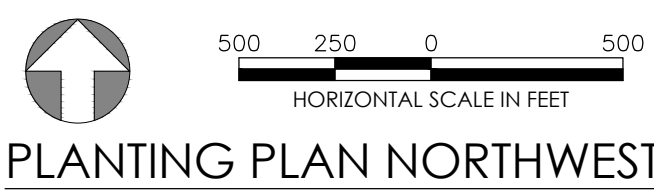
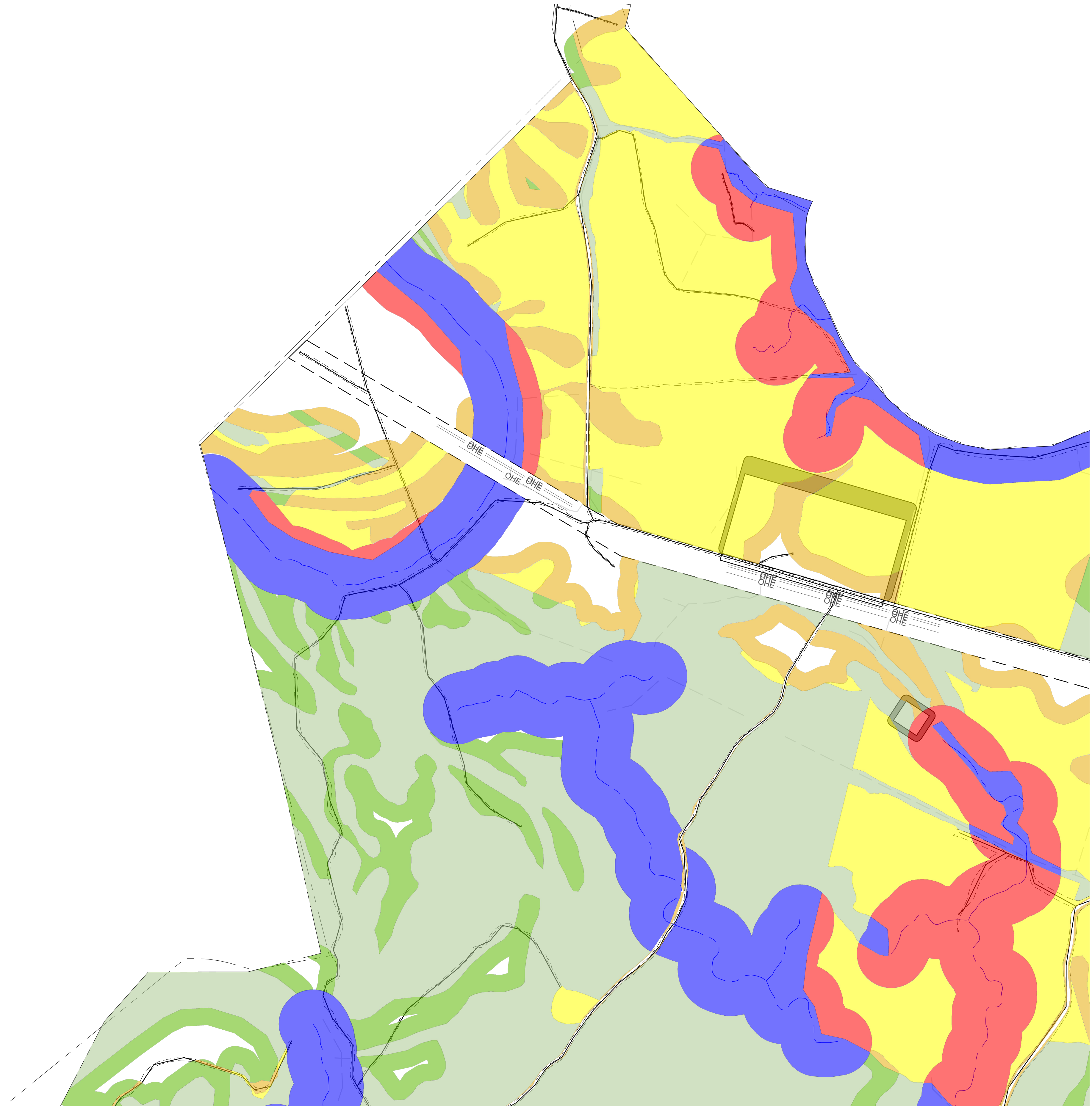
**WLS ENGINEERING PLLC**  
6 DULA SPRINGS RD., WEAVERVILLE, NC 28787  
FIRM LICENSE NO. P-1480

DESIGNED BY:	KNV	MDO	TG
DRAWN BY:			
APPROVED BY:			
SCALE:	AS NOTED		
DATE:	11/30/2023		
PROJECT NO.:	23-010		

**SCOUT MOTORS BLYTHEWOOD FACILITY PERMITTEE-RESPONSIBLE MITIGATION PLAN**  
RICHLAND COUNTY, SOUTH CAROLINA

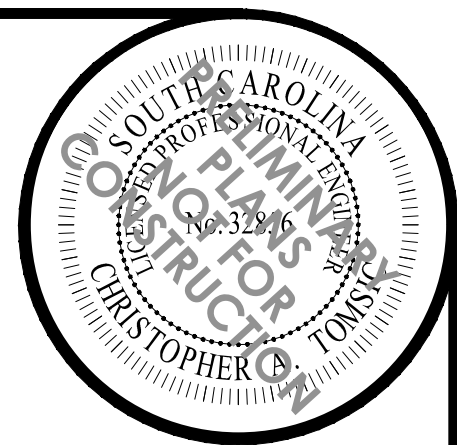
**PLANTING PLAN OVERVIEW**






PLANTING PLAN NORTHWEST

Permitted Plans



NO.	DESCRIPTION	DATE
1	FMP	11/30/2023

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DESIGNED BY:	KMV
DRAWN BY:	MDO
APPROVED BY:	TG
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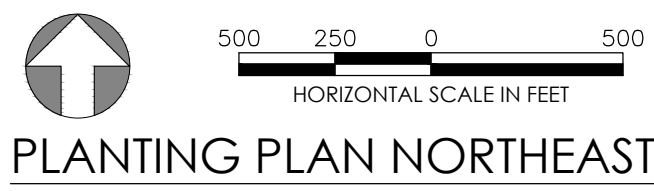
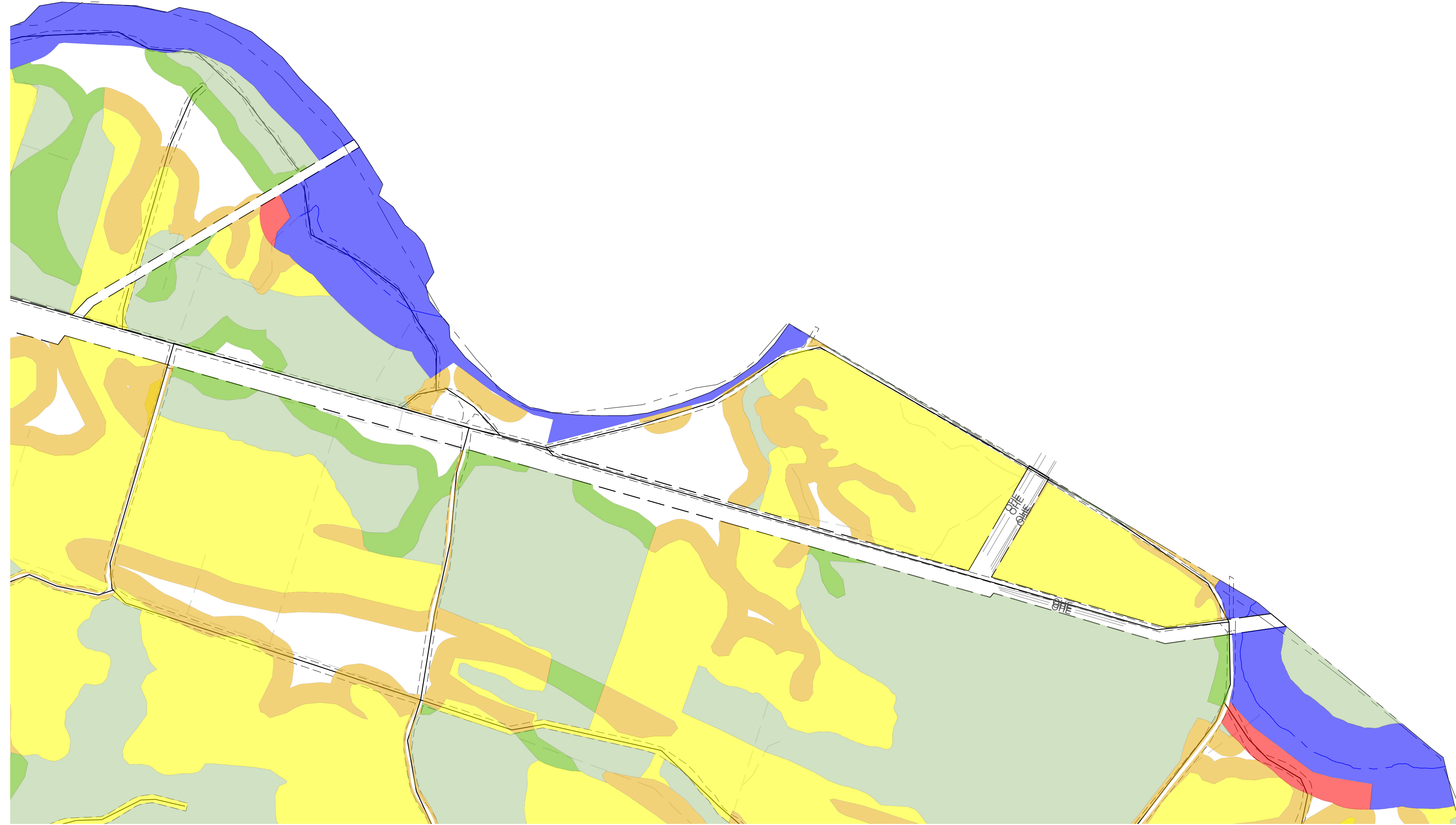
**PROJECT NAME**  
 SCOUT MOTORS BLYTHEWOOD FACILITY  
 PERMITTEE-RESPONSIBLE MITIGATION PLAN  
 RICHLAND COUNTY, SOUTH CAROLINA

**SHEET NAME**  
 PLANTING PLAN NORTHWEST

**SHEET NO.**  
 17

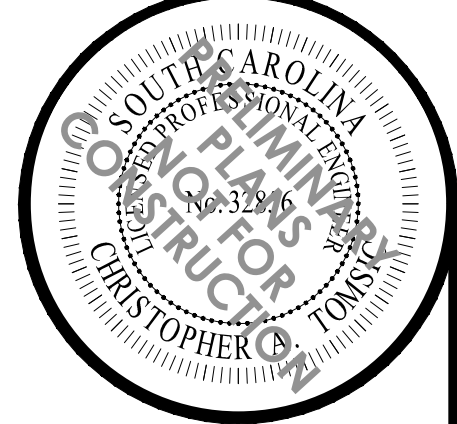


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PLANTING PLAN NORTHEAST

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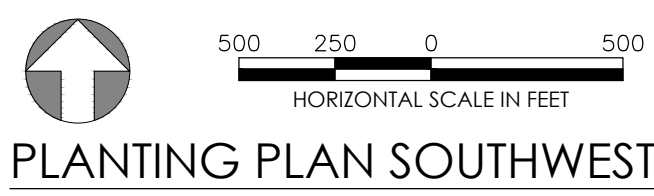
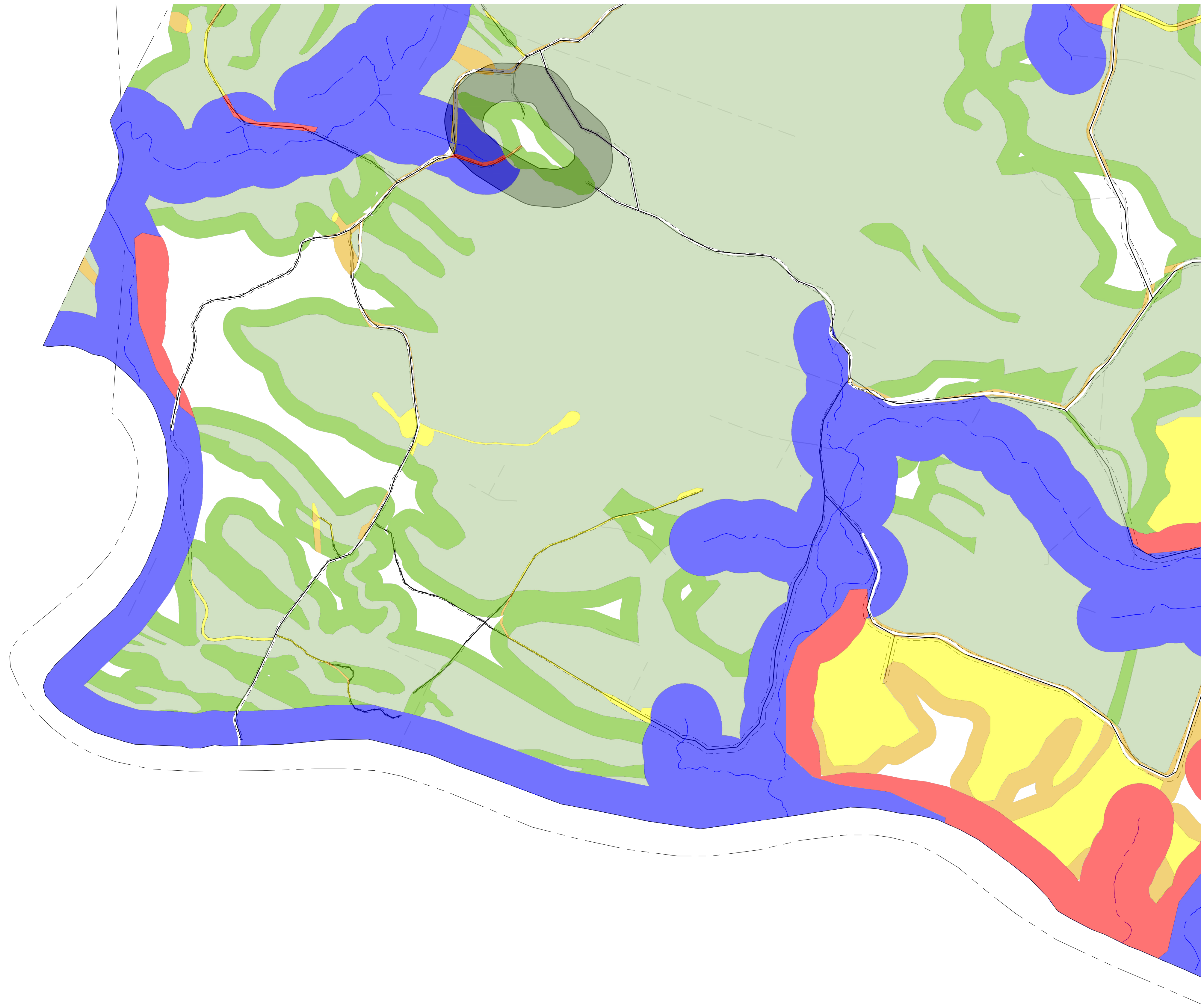
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 RICHLAND COUNTY, SOUTH CAROLINA

**SHEET NAME**  
 PLANTING PLAN NORTHEAST

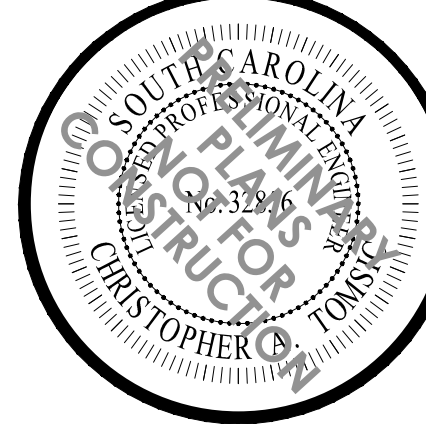
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PLANTING PLAN SOUTHWEST

Permitted Plans



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APPROVED BY:	AS NOTED		
SCALE:			
DATE:	11/30/2023		
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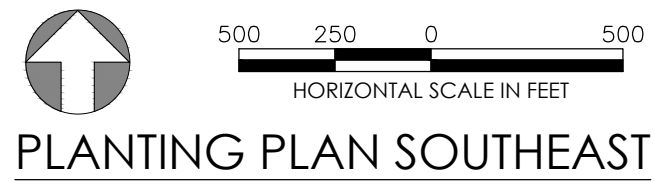
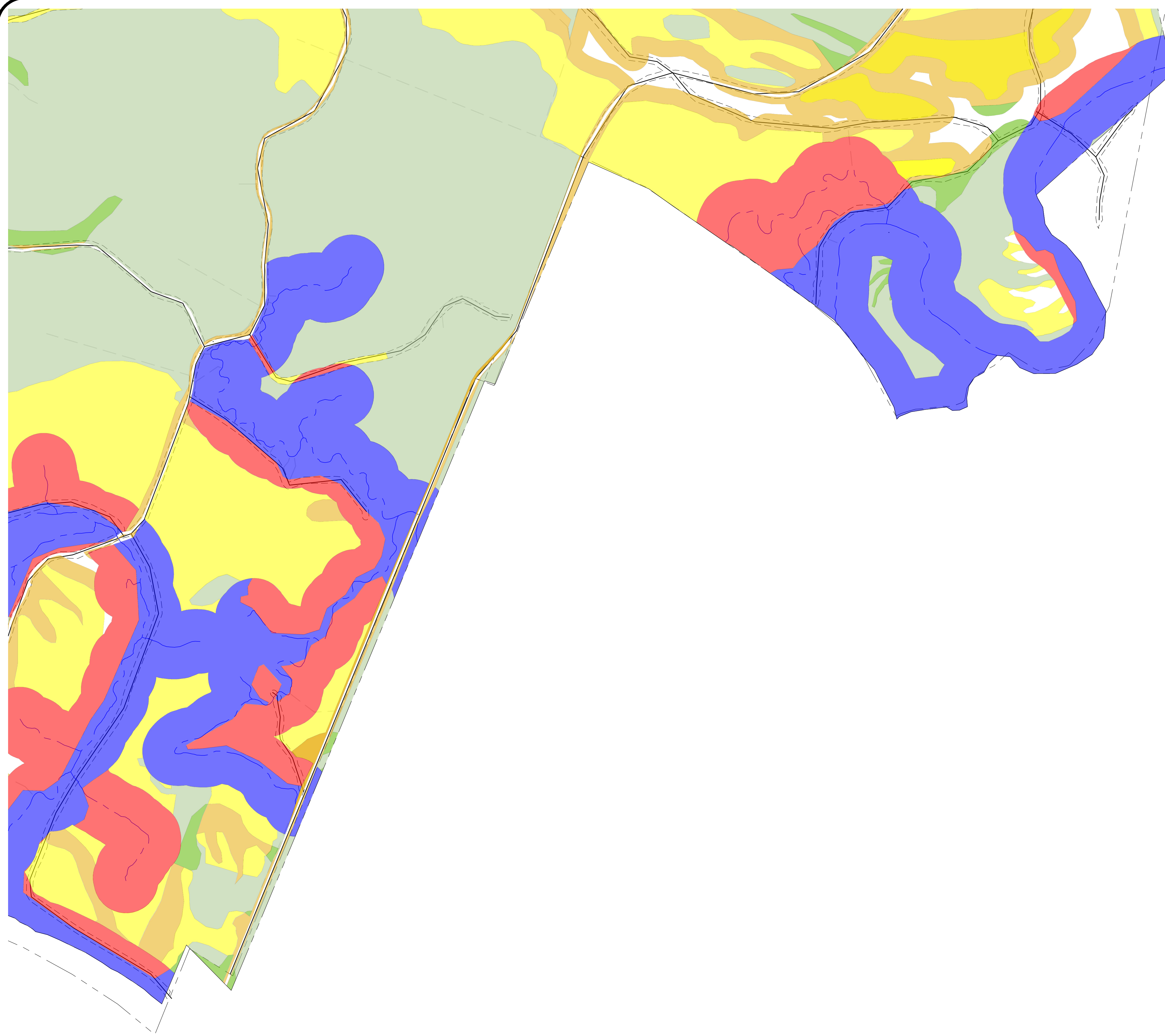
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 PERMITTEE-RESPONSIBLE MITIGATION PLAN  
 RICHLAND COUNTY, SOUTH CAROLINA

**SHEET NAME**  
 PLANTING PLAN SOUTHWEST

**SHEET NO.**  
 19

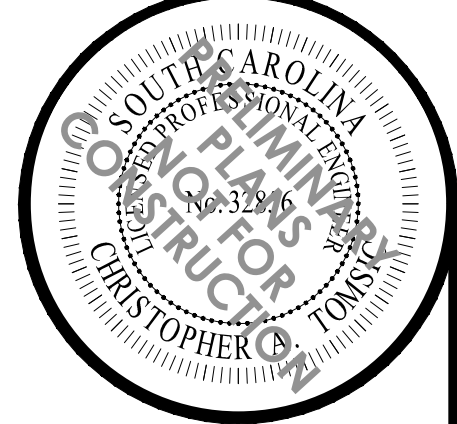


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PLANTING PLAN SOUTHEAST

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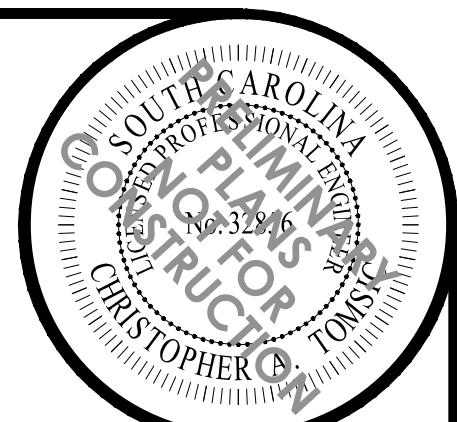
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PROJECT NO.:			23-010

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 PERMITTEE-RESPONSIBLE MITIGATION PLAN  
 RICHLAND COUNTY, SOUTH CAROLINA

**SHEET NAME**  
 PLANTING PLAN SOUTHEAST

SHEET NO.  
20





REVISIONS		DATE	DESCRIPTION
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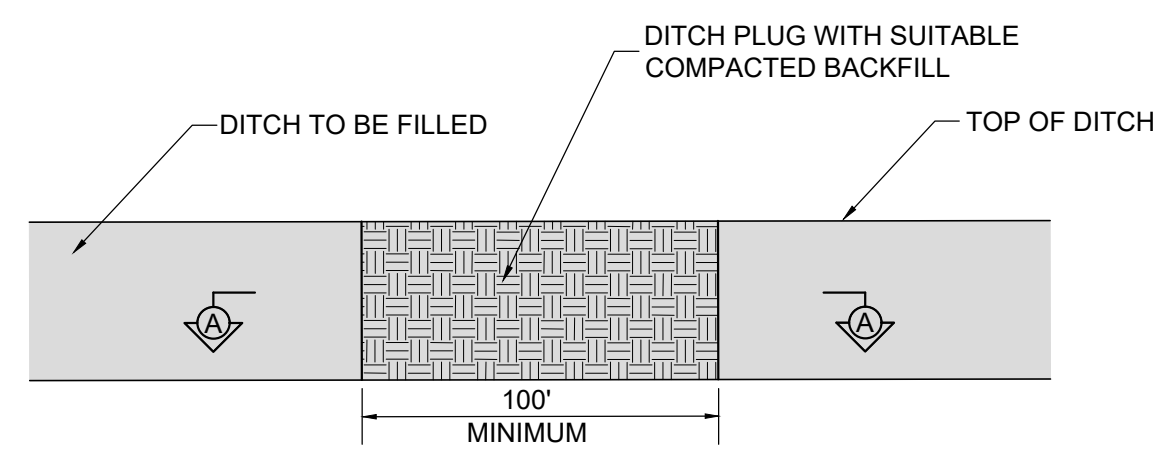
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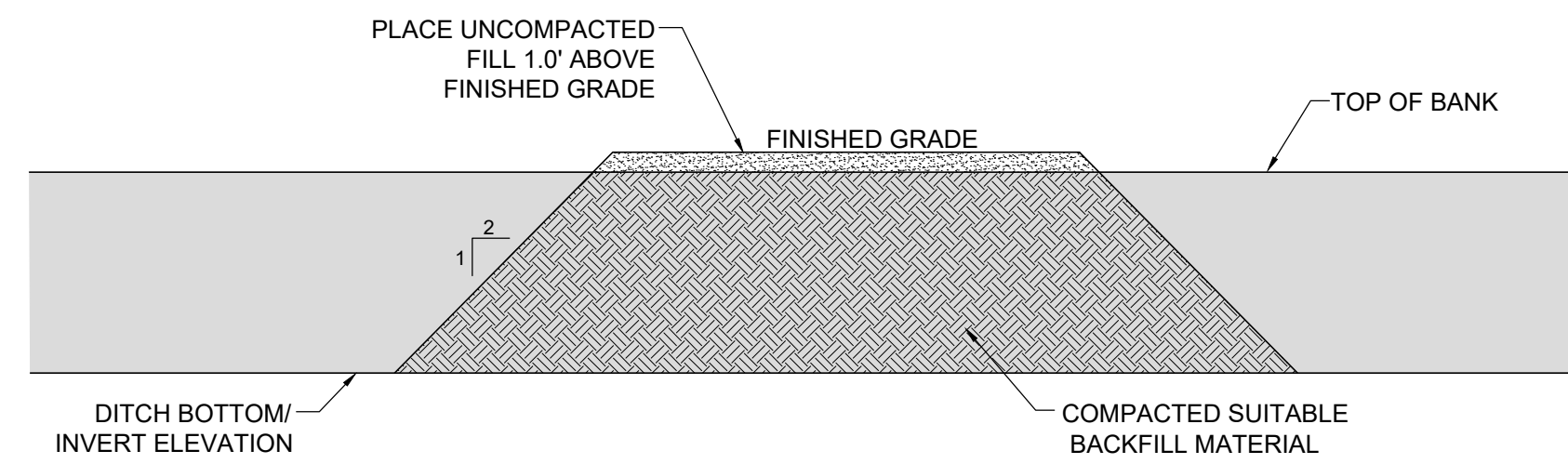
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APPROVED BY:	TG
SCALE:	AS NOTED
DATE:	11/30/2023
PROJECT NO.:	23-010

**SCOUT MOTORS BLYTHEWOOD FACILITY  
 PERMITTEE-RESPONSIBLE MITIGATION PLAN**  
 RICHLAND COUNTY, SOUTH CAROLINA

PROJECT NAME: SCOUT MOTORS BLYTHEWOOD FACILITY  
 SHEET NAME: DETAILS



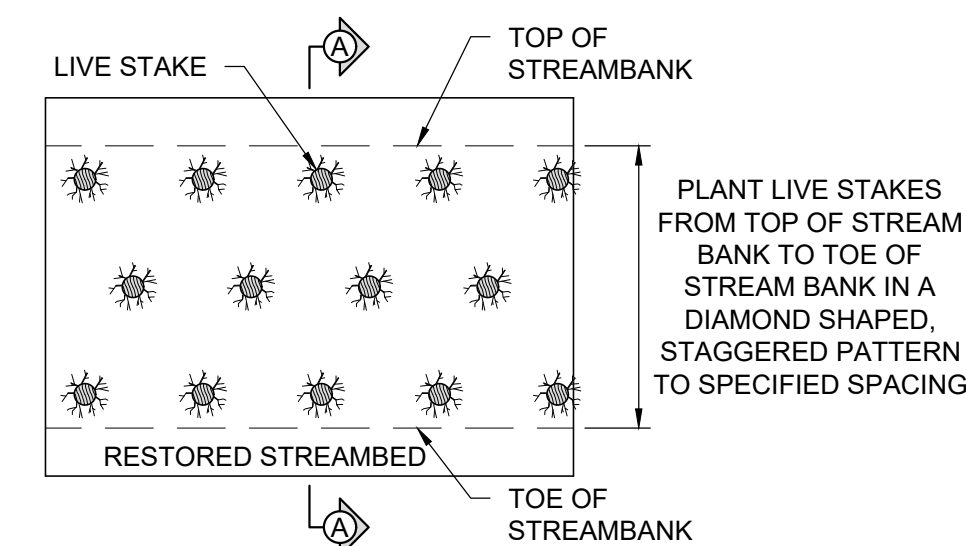
PLAN VIEW



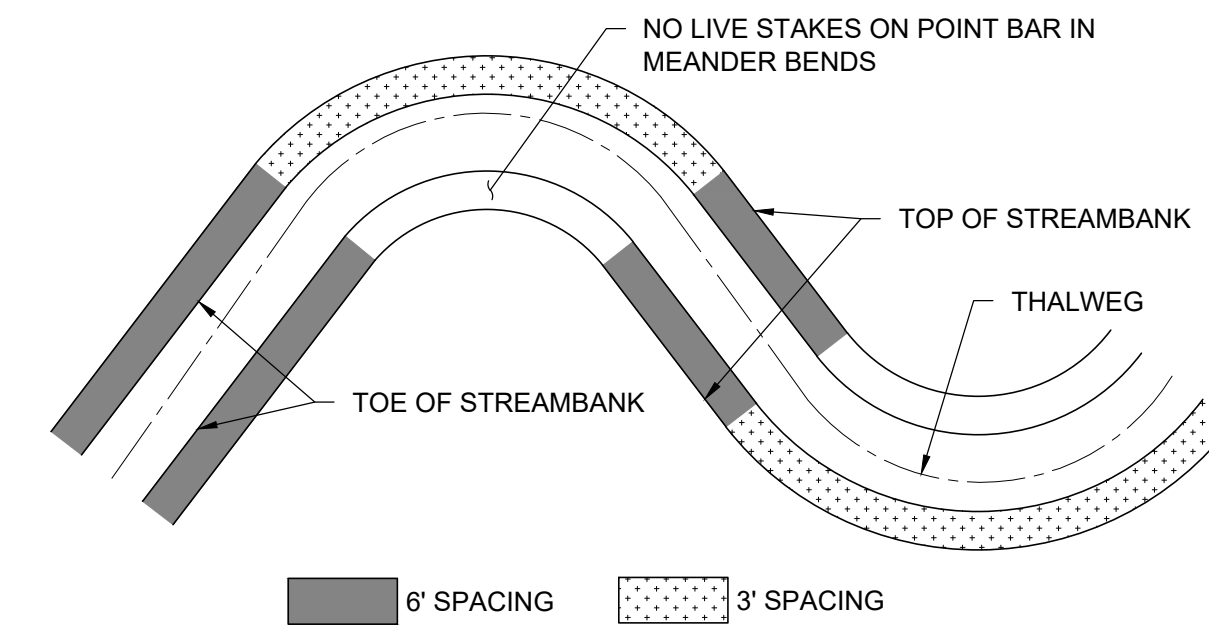
SECTION A-A

- NOTES:**
1. COMPACT DITCH PLUG MATERIAL FOR BACKFILL USING HEAVY EQUIPMENT IN 10 INCH LIFTS.
  2. CONSTRUCT DITCH PLUG WITH COMPACTED SOIL USING SUITABLE MATERIAL IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
  3. PLACE FILL MATERIAL IN LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY ENGINEER TO ALLOW FOR SETTLING.

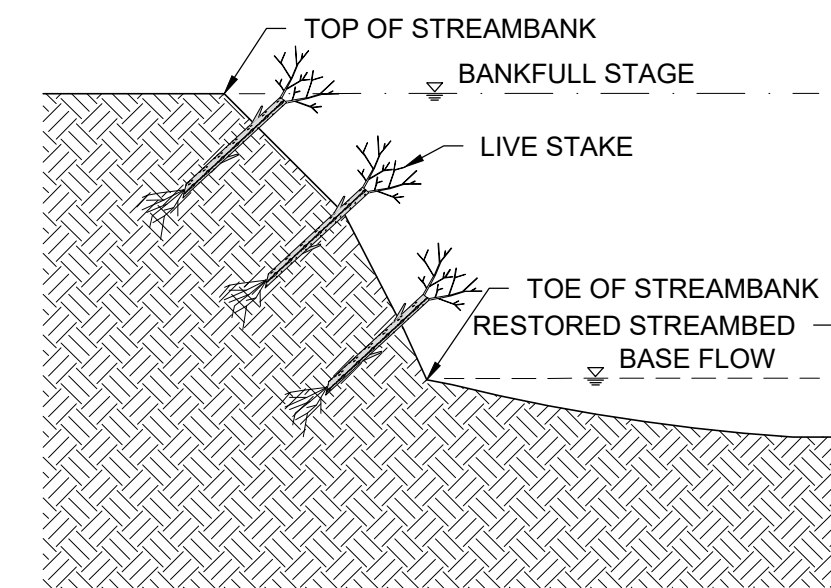
**DITCH PLUG**  
N.T.S



PLAN VIEW OF STREAM BANK



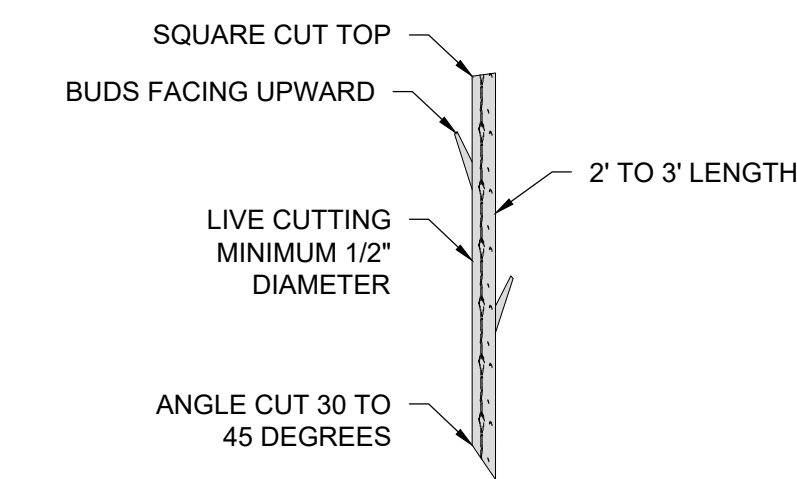
LIVE STAKE SPACING PLAN VIEW



SECTION A-A

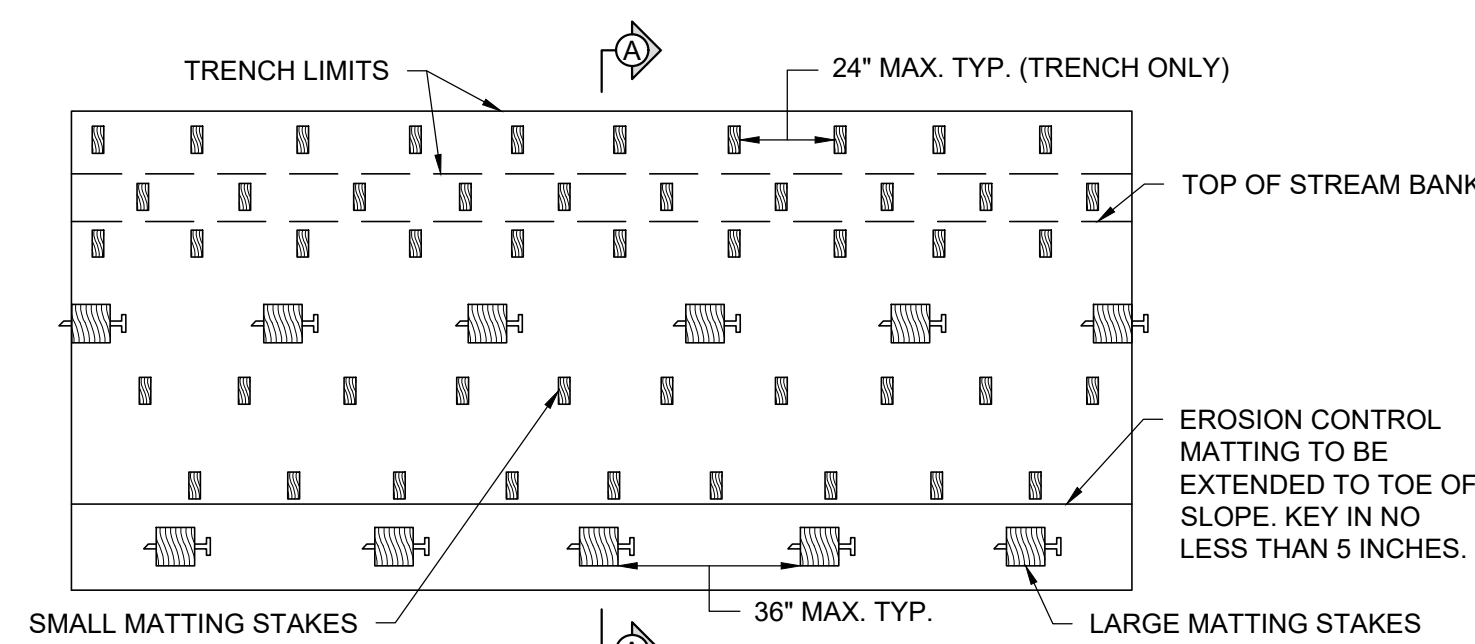
**NOTES:**

1. LIVE STAKES SHOULD BE CUT AND INSTALLED ON THE SAME DAY.
2. DO NOT INSTALL LIVE STAKES THAT HAVE BEEN SPLIT.
3. LIVE STAKES MUST BE INSTALLED WITH BUDS POINTING UPWARDS.
4. LIVE STAKES SHOULD BE INSTALLED PERPENDICULAR TO BANK.
5. LIVE STAKES SHOULD BE 1/2 TO 2 INCHES IN DIAMETER AND 2 TO 3 FEET LONG.
6. LIVE STAKES SHOULD BE INSTALLED LEAVING 1/5 OF THE LENGTH OF THE LIVE STAKE ABOVE GROUND.

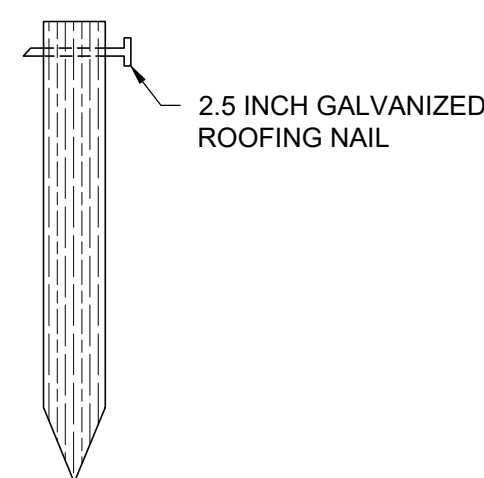


LIVE STAKE DETAIL

**LIVE STAKING**  
NOT TO SCALE

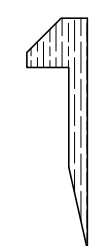


PLAN VIEW OF STREAM BANK



TYPICAL LARGE MATTING STAKE

LENGTH	24.00 IN (60.96 CM) (TAPERED TO POINT)
WIDTH	1.5 IN (3.81 CM)
THICKNESS	1.5 IN (3.81 CM)

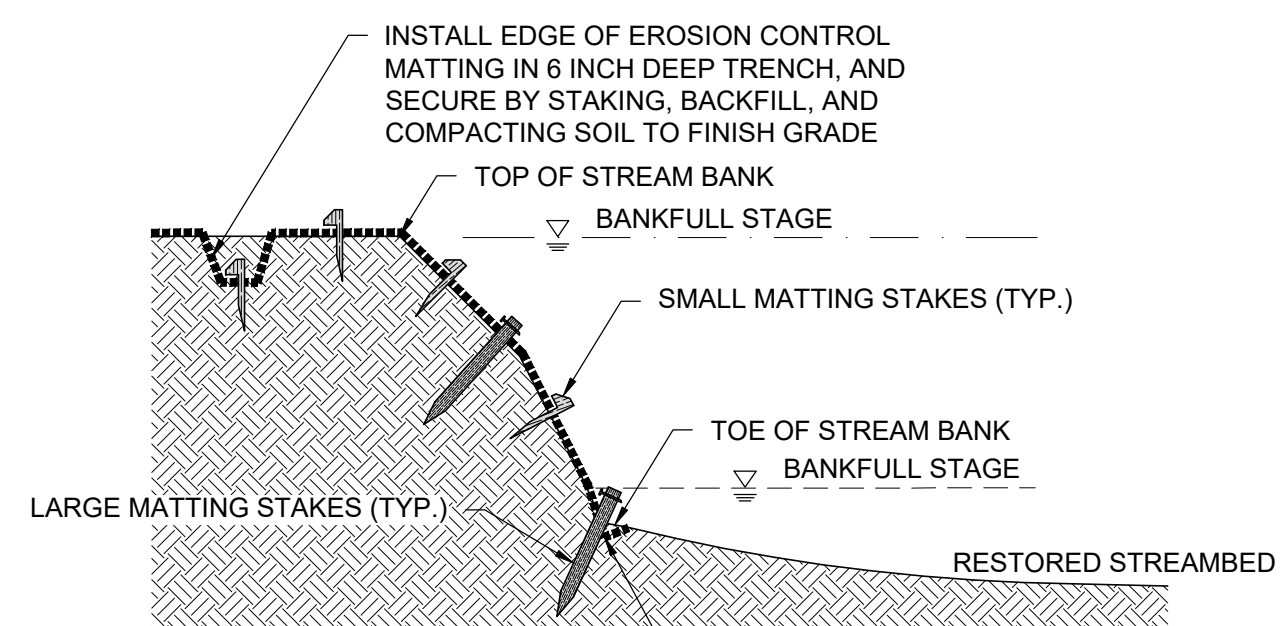


TYPICAL SMALL MATTING STAKE

LEG LENGTH	11.00 IN (27.94 CM)
HEAD WIDTH	1.25 IN (3.16 CM)
HEAD THICKNESS	0.40 IN (1.02 CM)
LEG WIDTH	0.60 IN (1.52 CM) (TAPERED TO POINT)
LEG THICKNESS	0.40 IN (1.02 CM)
TOTAL LENGTH	12.00 IN (30.48 CM)

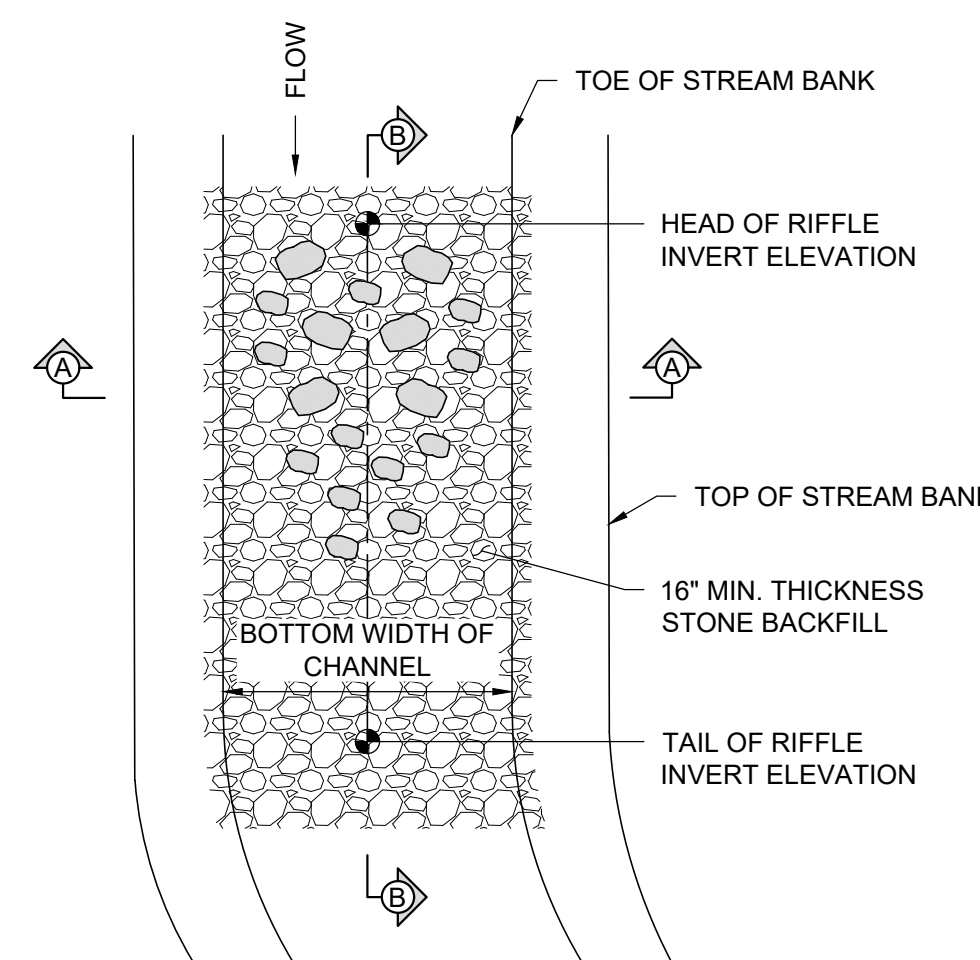
**NOTES:**

1. RESTORED STREAM BANKS MUST BE SEEDED AND MULCHED PRIOR TO PLACEMENT OF EROSION CONTROL MATTING.
2. SEE TECHNICAL SPECIFICATIONS FOR MATTING STAKE SPACING REQUIREMENTS.
3. PLACE LARGE STAKES ALONG ALL MATTING SEAMS, IN THE CENTER OF STREAM BANK, AND TOE OF SLOPE.



SECTION A-A

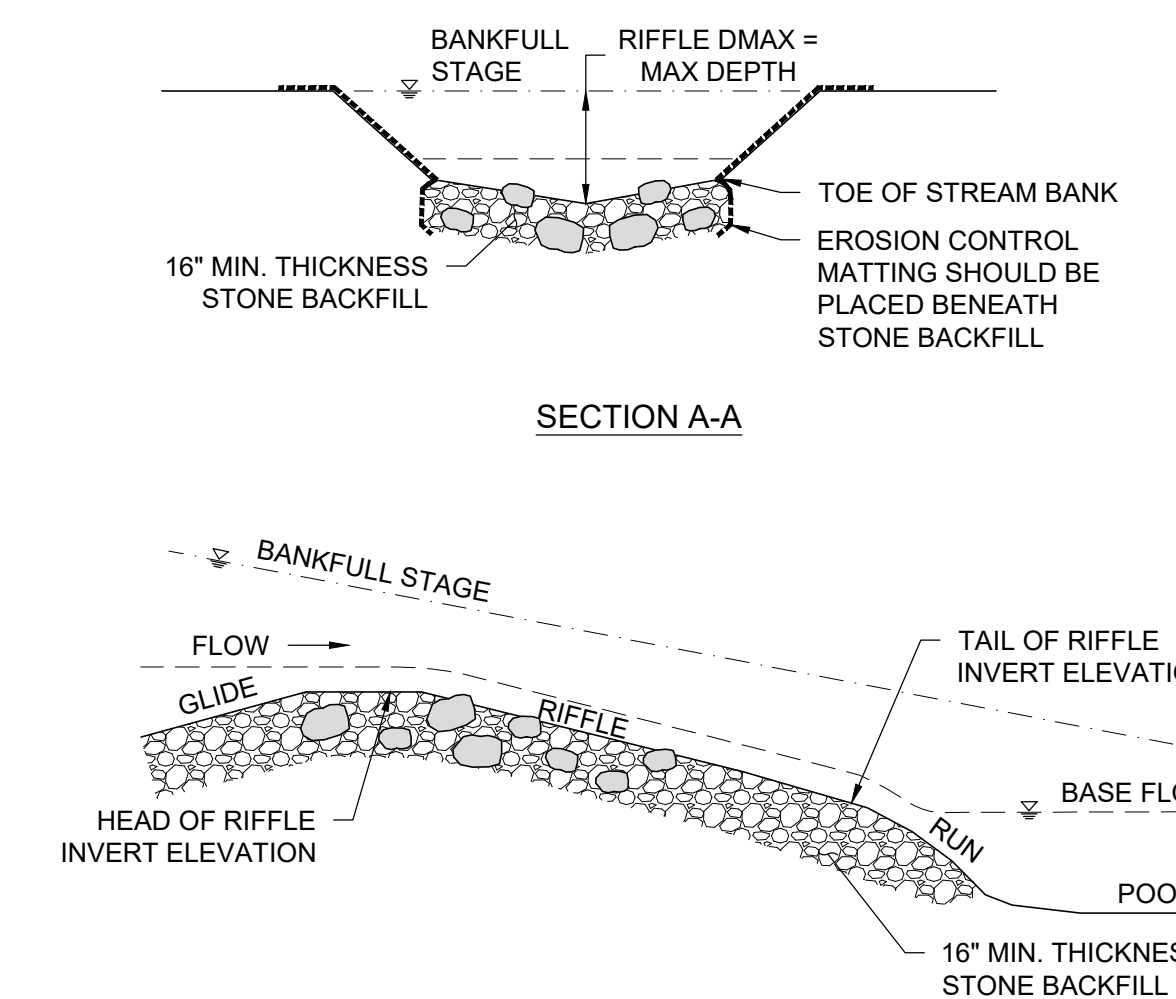
**EROSION CONTROL MATTING**  
NOT TO SCALE



**NOTES:**

1. DIG A TRENCH BELOW THE RESTORED STREAMBED FOR THE STONE BACKFILL.
2. FILL TRENCH WITH EQUAL PARTS CLASS "A", CLASS "B", AND CLASS I STONE BACKFILL.

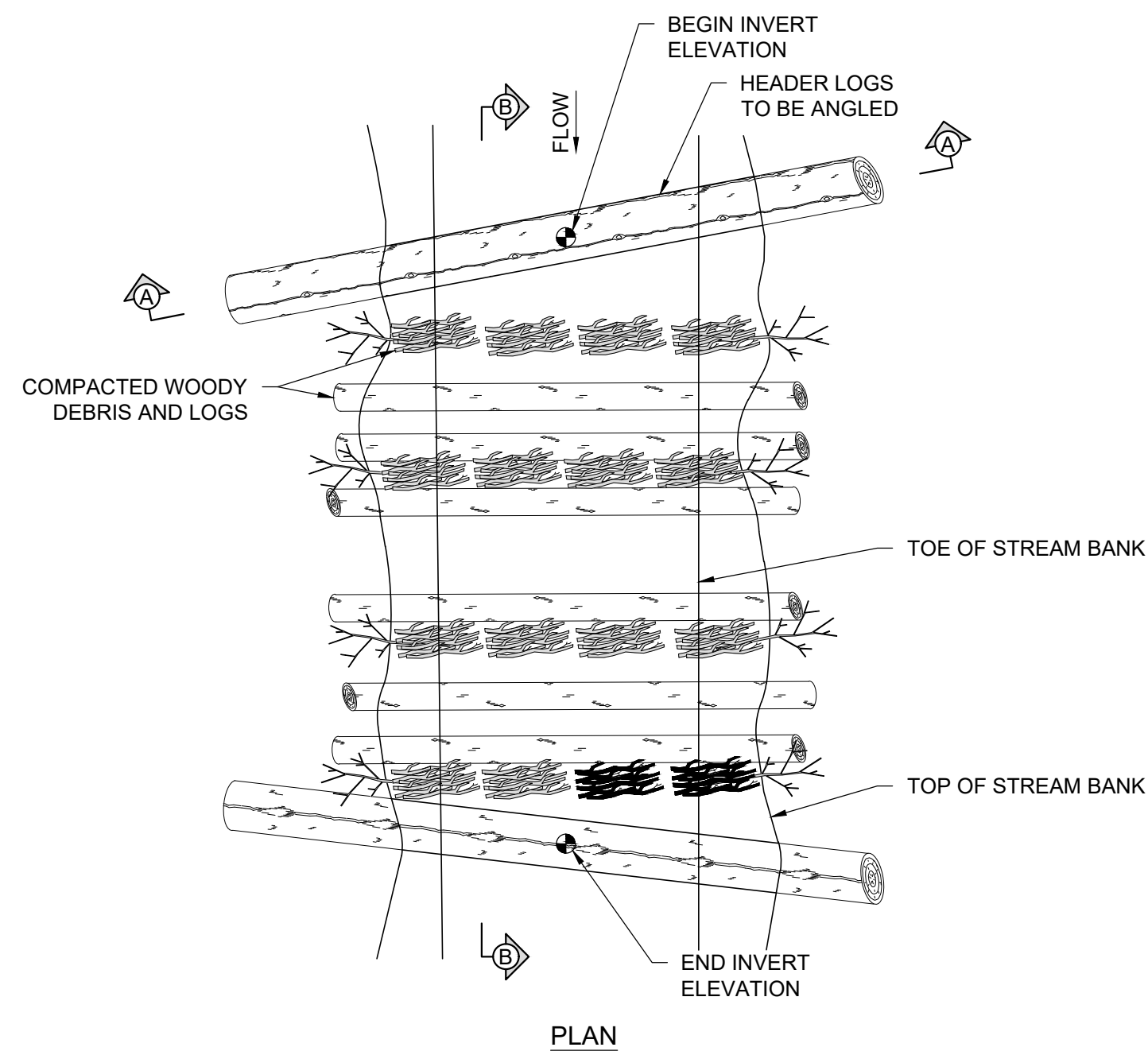
**CONSTRUCTED STONE RIFFLE**  
NOT TO SCALE



SECTION A-A

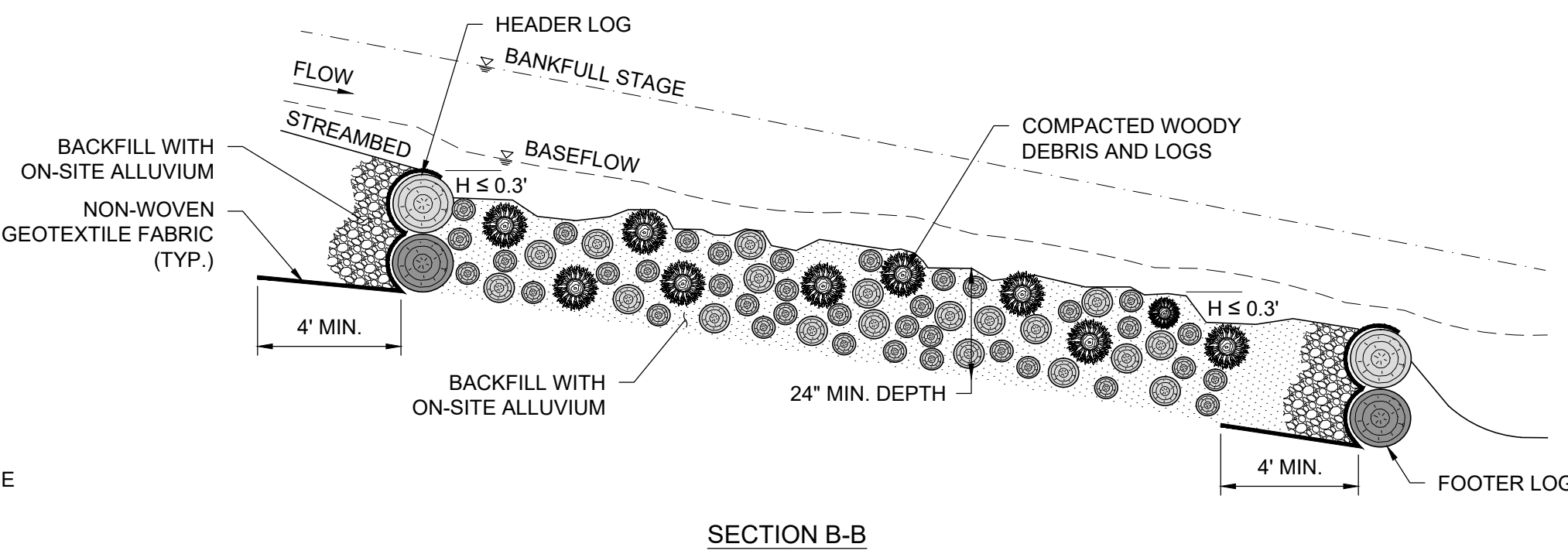
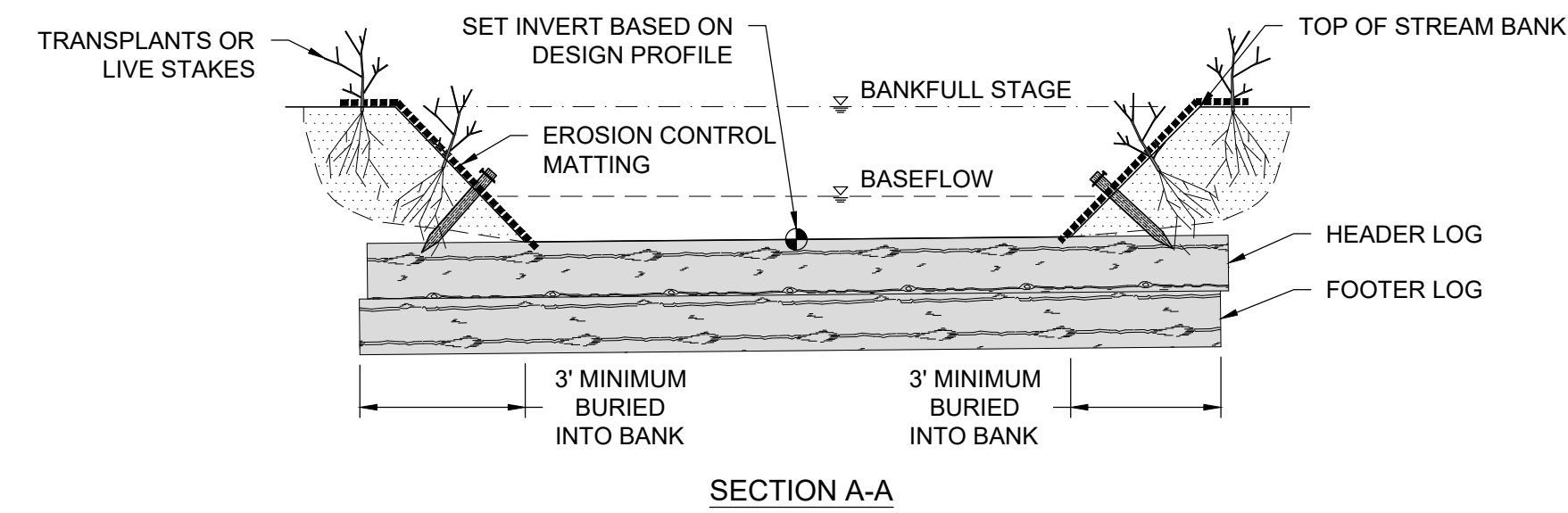
SECTION B-B



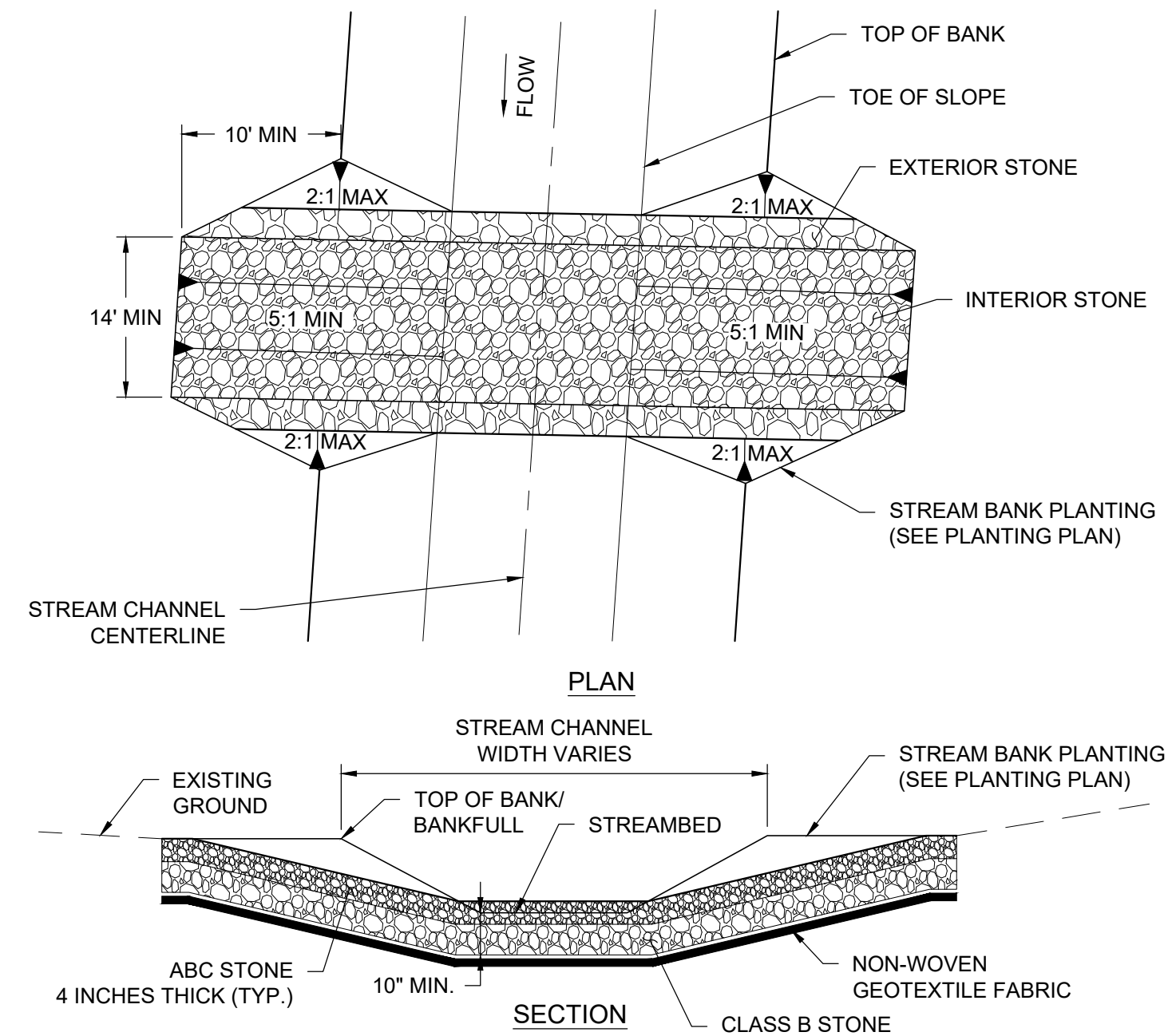


**NOTES:**

- WOODY DEBRIS DEPTH SHALL BE NO LESS THAN 24".
- WOODY DEBRIS MATERIAL SHOULD BE A MIX OF SMALL AND LARGE LIMBS AND LOGS. LOGS SHALL BE AT LEAST 4" IN DIAMETER AND NO LARGER THAN 10" AND EXTEND INTO THE BANK 3' ON EACH SIDE. WOODY DEBRIS MATERIAL SHALL BE VARYING DIAMETER TO ALLOW MATERIAL TO BE COMPACTED.
- NON-WOVEN GEOTEXTILE FABRIC SHOULD BE NAILED TO THE HEADER LOG BELOW THE BACKFILL. AFTER TRENCH HAS BEEN EXCAVATED LOGS AND WOODY DEBRIS SHOULD BE PLACED WITH MINIMAL GAPS. A LAYER OF ON-SITE ALLUVIUM SHOULD BE APPLIED TO FILL VOIDS BETWEEN LOGS AND WOODY DEBRIS BEFORE ADDITIONAL LAYERS ARE PLACED.



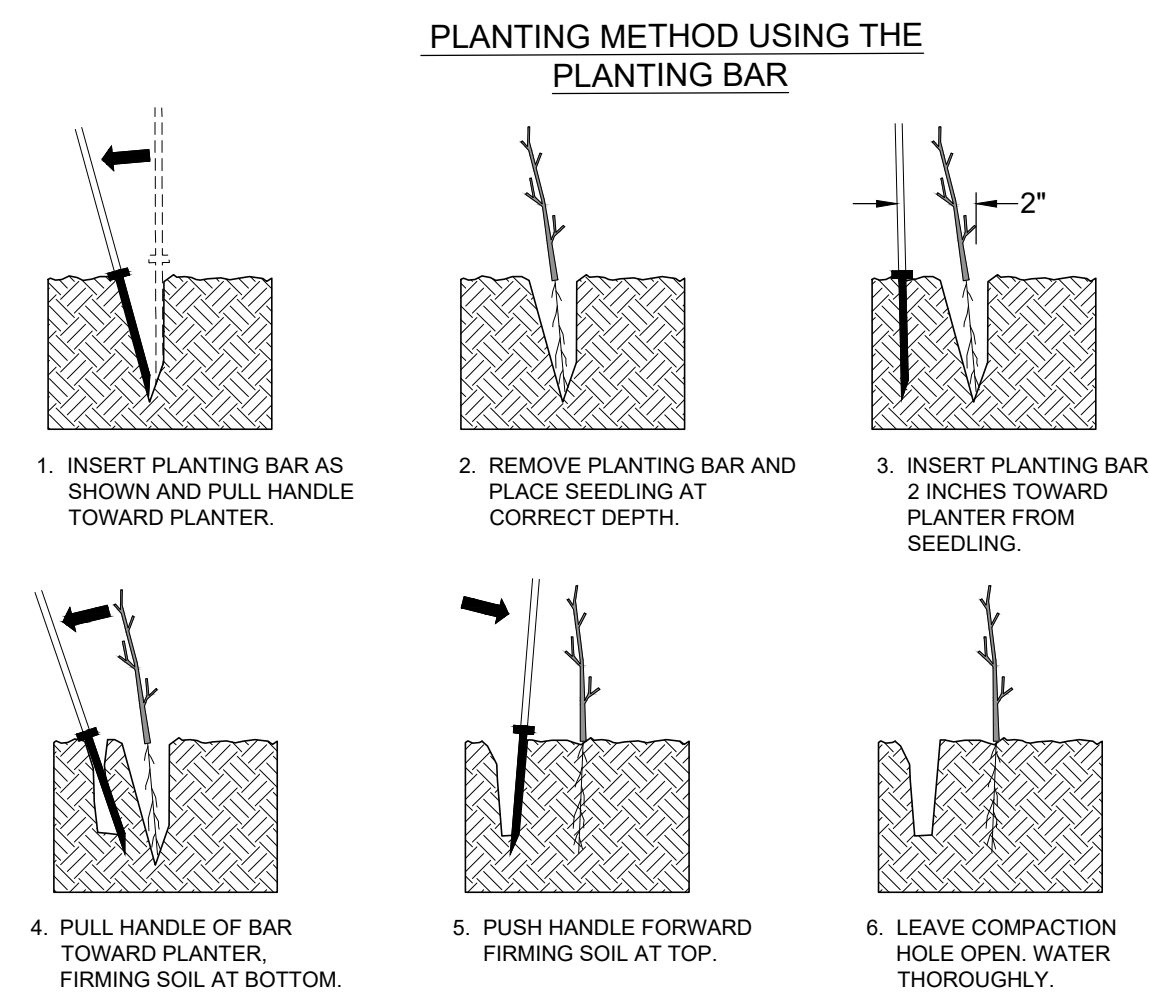
**CONSTRUCTED BRUSHY RIFFLE**  
NOT TO SCALE



**NOTES:**

- CONSTRUCT FORD STREAM CROSSING DURING LOW OR BASE FLOW CONDITIONS.
- HAVE ALL NECESSARY MATERIALS AND EQUIPMENT ON-SITE BEFORE WORK BEGINS.
- MINIMIZE CLEARING AND EXCAVATION OF STREAM BANKS. DO NOT EXCAVATE CHANNEL BOTTOM. COMPLETE ONE SIDE BEFORE STARTING ON THE OTHER SIDE.
- INSTALL FORD STREAM CROSSING PERPENDICULAR TO THE FLOW.
- GRADE APPROACHES NO STEEPER THAN 5H:1V SLOPE. IF POSSIBLE TRANSPLANT NATIVE VEGETATION FROM ORIGINAL STREAM BANK ONTO SIDE SLOPES AT 2H:1V MAX.
- MAINTAIN FORD STREAM CROSSING SO THAT SEDIMENT AND RUNOFF FROM THE CONSTRUCTION ACCESS ROAD DOES NOT ENTER EXISTING CHANNEL.
- STABILIZE CROSSING USING MIX OF 6 INCHES CLASS B STONE LINED WITH NON-WOVEN GEOTEXTILE FABRIC FOR DRAINAGE SHALL BE USED OVER ACCESS SLOPES. ABC STONE APPROXIMATELY 4 INCHES THICK SHALL BE ADDED TO TOP LAYER.
- WIDTH OF THE CROSSING SHALL BE SUFFICIENT TO ACCOMMODATE EQUIPMENT CROSSING THE CHANNEL OR A MINIMUM OF 14 FEET.
- AN APPROPRIATE RAMP ANGLE WILL BE DETERMINED BY THE ENGINEER ACCORDING TO EQUIPMENT UTILIZED.

**STREAM CROSSING - FORD**  
NOT TO SCALE

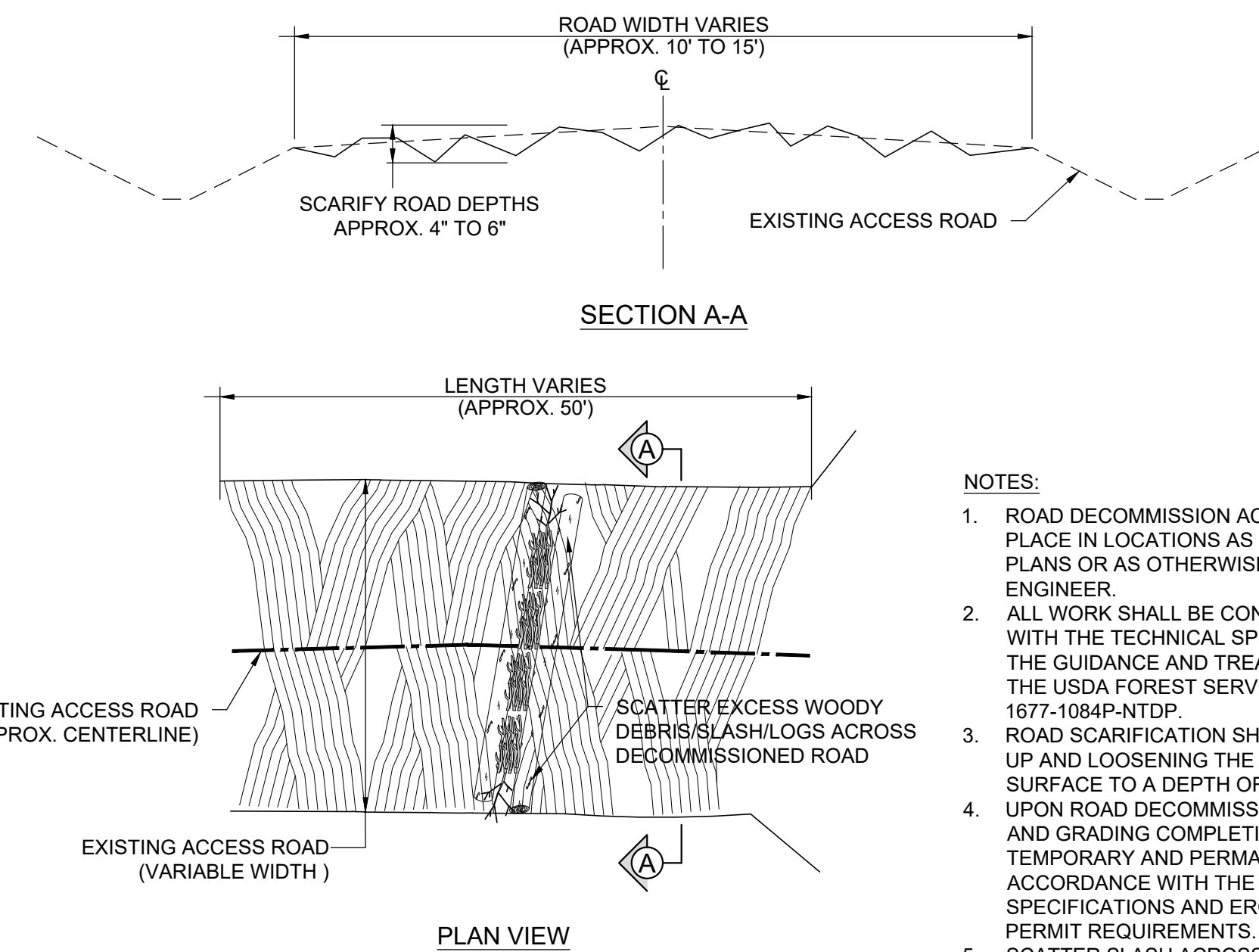
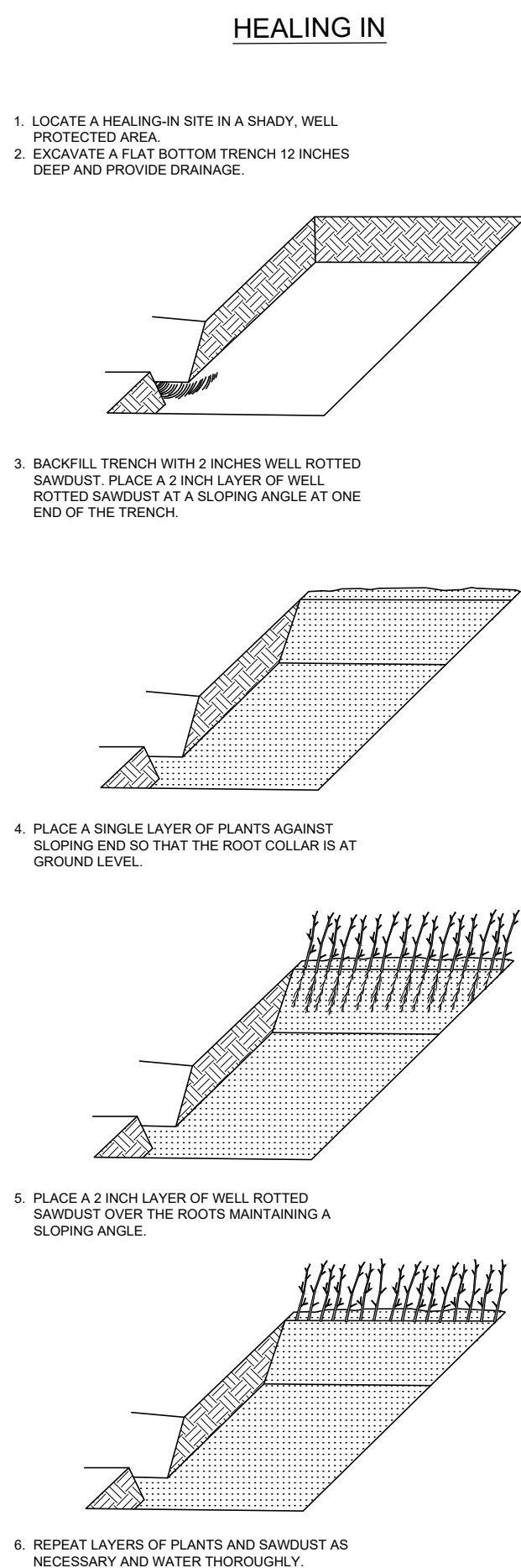


**NOTES:**

- PLANT BARE ROOT VEGETATION TO THE WIDTH OF THE BUFFER/PLANTING ZONE AS SHOWN ON THE PLANS.
- ALLOW FOR 8-15 FEET SPACING BETWEEN PLANTINGS, AS DEFINED IN THE TECHNICAL SPECIFICATIONS.
- LOOSEN COMPACTED SOIL.
- PLANT IN HOLES MADE BY A MATCOCK, DIBBLE, PLANTING BAR OR OTHER APPROVED MEANS.
- PLANT IN HOLES DEEP AND WIDE ENOUGH TO ALLOW THE ROOTS TO SPREAD OUT AND DOWN WITHOUT J-ROOTING.
- KEEP ROOTS MOIST WHILE DISTRIBUTING OR WAITING TO PLANT BY MEANS OF WET CANVAS, BURLAP OR STRAW.
- HEEL-IN PLANTS IN MOIST SOIL OR SAWDUST IF NOT PROMPTLY PLANTED UPON ARRIVAL TO THE PROJECT SITE.
- DURING PLANTING, SEEDLINGS SHALL BE KEPT IN A MOIST CANVAS BAG OR SIMILAR CONTAINER TO PREVENT ROOT SYSTEMS FROM DYING.
- PLANTING BAR SHALL HAVE A BLADE WITH A TRIANGULAR CROSS SECTION AND SHALL BE 12 INCHES LONG, 4 INCHES WIDE AND 1 INCH THICK AT CENTER.
- ALL SEEDLINGS SHALL BE PRUNED IF NECESSARY, SO THAT NO ROOTS EXTEND MORE THAN 10 INCHES BELOW THE ROOT COLLAR.



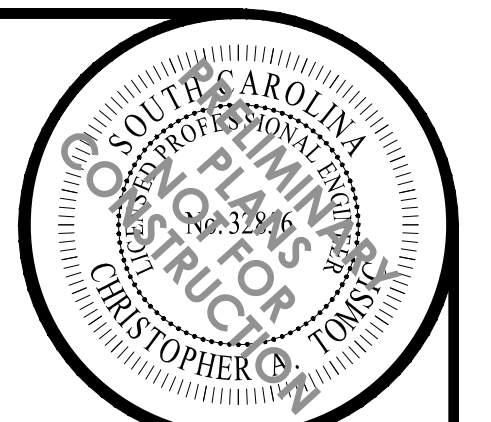
**BARE ROOT PLANTING DETAIL**  
NOT TO SCALE



**NOTES:**

- ROAD DECOMMISSION ACTIVITIES SHALL TAKE PLACE IN LOCATIONS AS SHOWN ON THE DESIGN PLANS OR AS OTHERWISE DIRECTED BY THE ENGINEER.
- ALL WORK SHALL BE CONDUCTED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS AND PER THE GUIDANCE AND TREATMENTS DESCRIBED IN THE USDA FOREST SERVICE TECHNICAL REPORT 1677-1084P-NTDP.
- ROAD SCARIFICATION SHALL INCLUDE BREAKING UP AND LOOSENING THE COMPACTED ROAD SURFACE TO A DEPTH OF 4-6 INCHES.
- UPON ROAD DECOMMISSION, CULVERT REMOVAL AND GRADING COMPLETION, APPLY MULCH, TEMPORARY AND PERMANENT SEED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS AND EROSION CONTROL/ SWPPP PERMIT REQUIREMENTS.
- SCATTER SLASH ACROSS DECOMMISSIONED ROAD BEYOND ENTRANCE USING LOCAL NATIVE WOODY MATERIAL UNTIL PERMANENT VEGETATION BECOMES ESTABLISHED.

**ROAD DECOMMISSION DETAIL**  
NOT TO SCALE



NO.	DESCRIPTION	DATE
1	FMP	11/30/2023

**WATER & LAND SOLUTIONS**  
1859 Summerville Avenue, Suite 770  
Charleston, SC 29405  
(919) 552-9253  
waterandsolutions.com

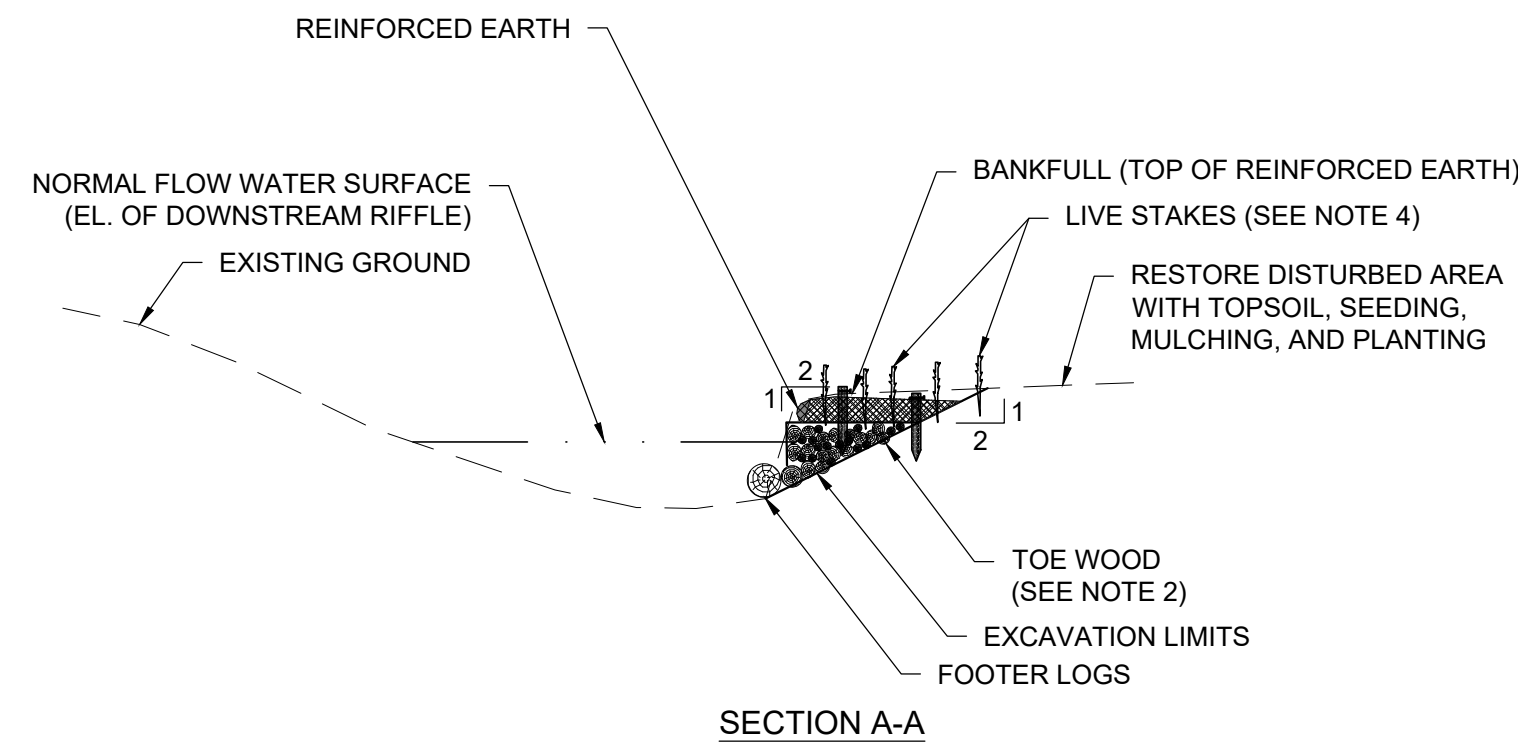
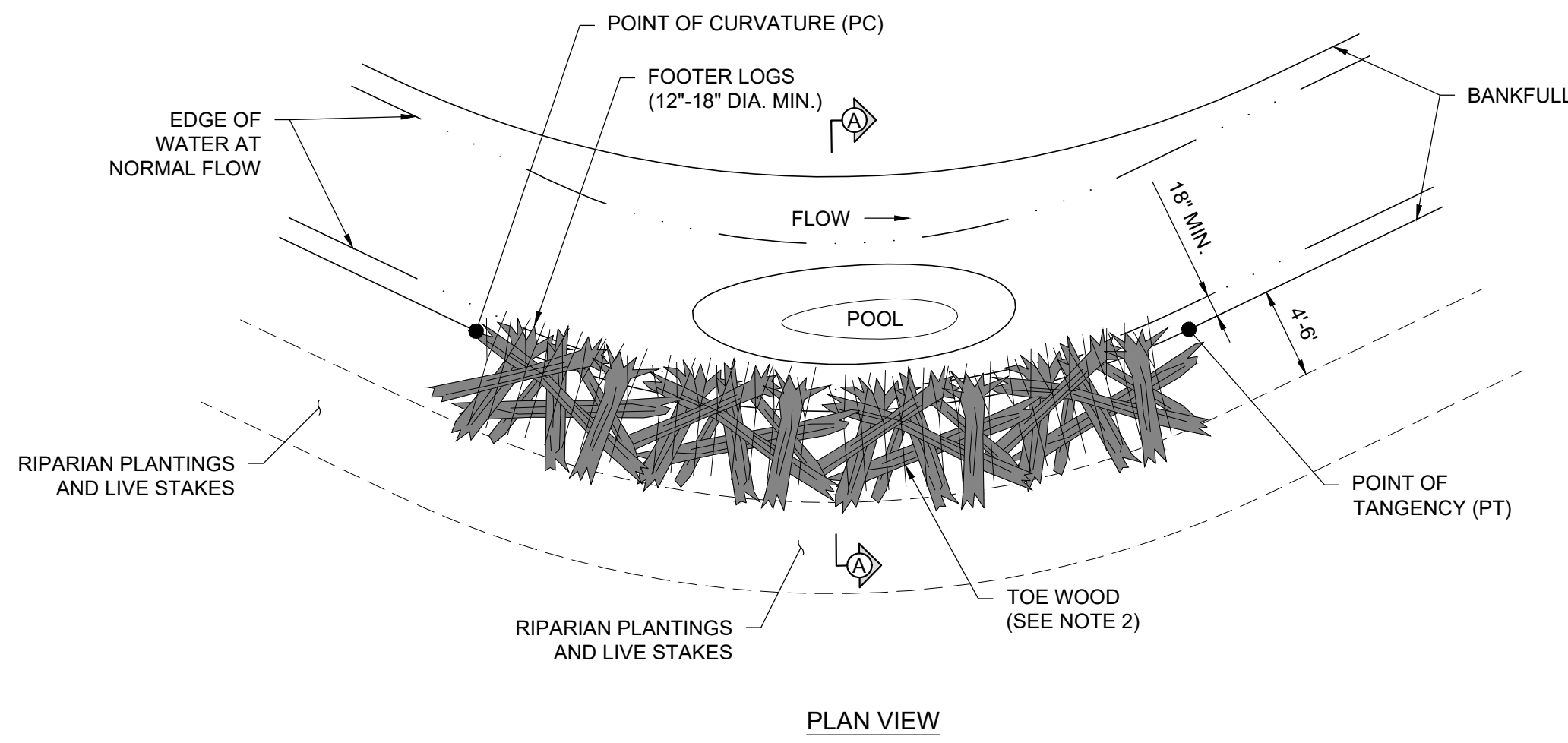
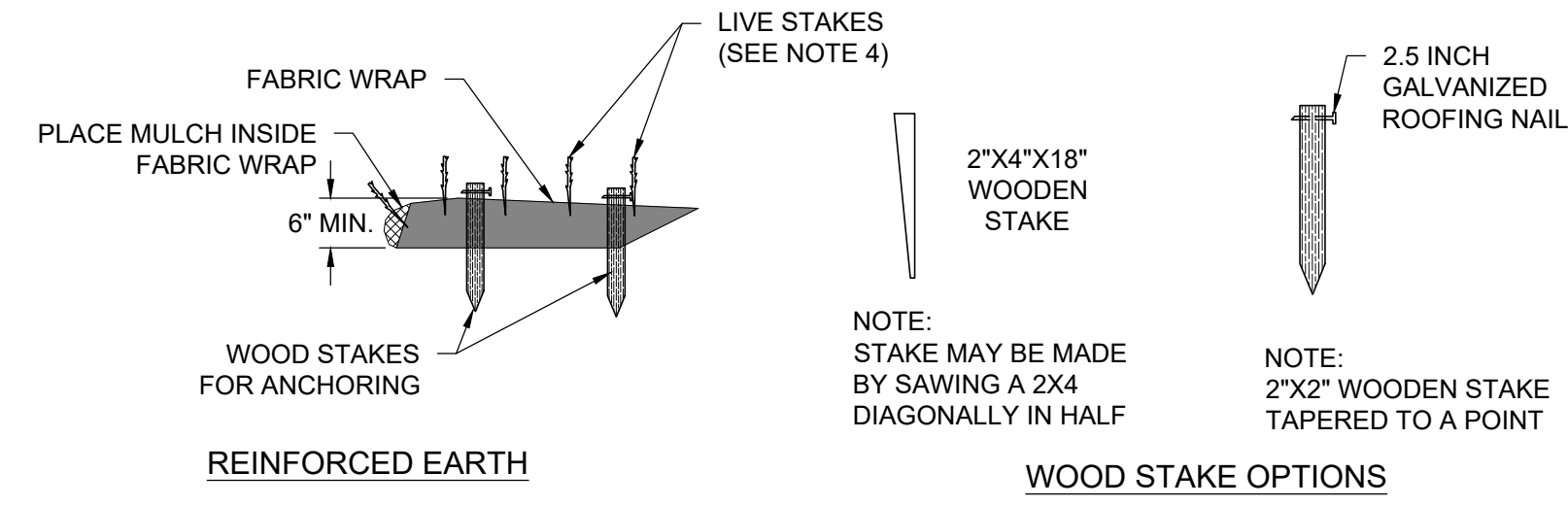
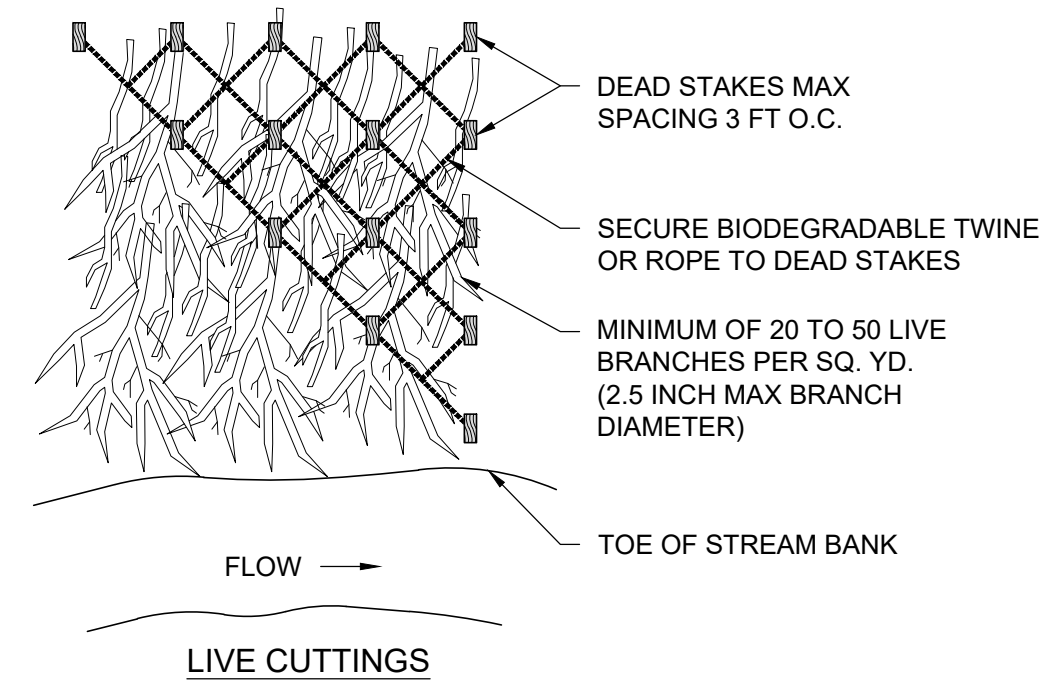
**WLS ENGINEERING PLLC**  
6 DULA SPRINGS RD., WEAVERVILLE, NC 28787  
FIRM LICENSE NO. P-1480

DESIGNED BY:	KNV	MDO	TG	AS NOTED	DATE:	PROJECT NO.:
DRAWN BY:					11/30/2023	23-010
APPROVED BY:						
SCALE:						

**SCOUT MOTORS BLYTHEWOOD FACILITY PERMITEE-RESPONSIBLE MITIGATION PLAN**  
RICHLAND COUNTY, SOUTH CAROLINA

PROJECT NAME: SCOUT MOTORS BLYTHEWOOD FACILITY PERMITEE-RESPONSIBLE MITIGATION PLAN  
SHEET NAME: DETAILS

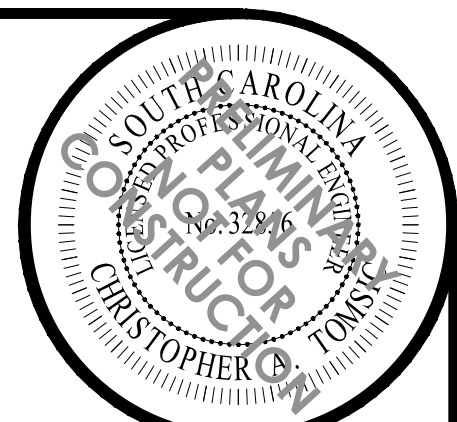
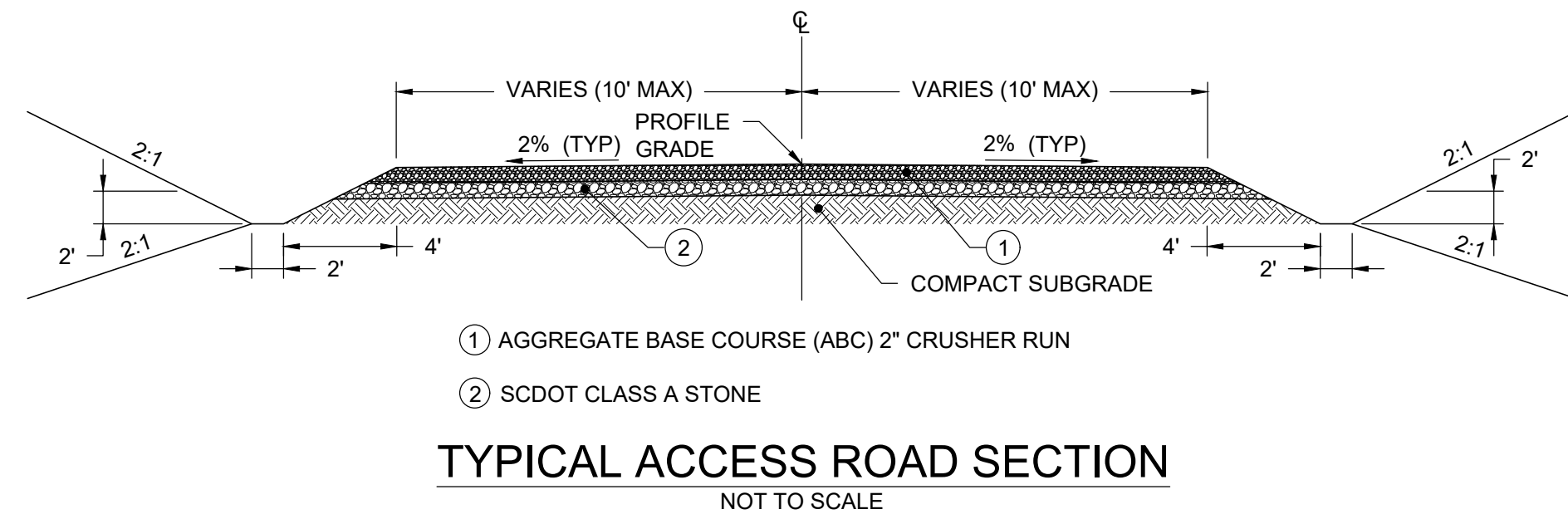




NOTES:

- IF AN APPROVED ON-SITE SOURCE IS AVAILABLE, SOD MATS LAYERS MAY BE USED INSTEAD OF REINFORCED EARTH. SOD MATS MAY ALSO BE OBTAINED FROM CLEARING AND EXCAVATION WORK ASSOCIATED WITH THE PROJECT. THE NUMBER OF LAYERS OF REINFORCED EARTH OR SOD MATS MAY VARY WITH THE BANK HEIGHT.
- TOE WOOD CONSISTS OF A MIX OF LOGS, BRANCHES, BRUSH, AND OTHER WOODY VEGETATION INSTALLED AT VARIOUS ANGLE, BUT NOT PARALLEL TO THE FLOW. LAYER THE WOOD WITH LARGER MATERIAL ON THE BOTTOM AND A MAT OF BRANCHES AS THE TOP LAYER. THE TOP LAYER OF TOE WOOD SHALL BE AT THE ESTABLISHED NORMAL FLOW ELEVATION.
- LAYER REINFORCED EARTH AND CUTTINGS TO BANKFULL.
- LIVE STAKES SHALL BE USED IN LIEU OF LIVE CUTTINGS IF CONSTRUCTION OCCURS OUTSIDE THE DORMANT PLANTING SEASON. LIVE STAKES SHALL BE INSTALLED AFTER REINFORCED EARTH IS CONSTRUCTED BUT DURING DORMANT PLANTING SEASON.

TOE WOOD WITH LIVE BRUSH LAYERING  
 NOT TO SCALE



NO.	DESCRIPTION	DATE
1	FMP	11/30/2023

**WATER & LAND SOLUTIONS**  
 1859 Summerville Avenue, Suite 770  
 Charleston, SC 29405  
 (919) 552-9253  
 waterandsolutions.com

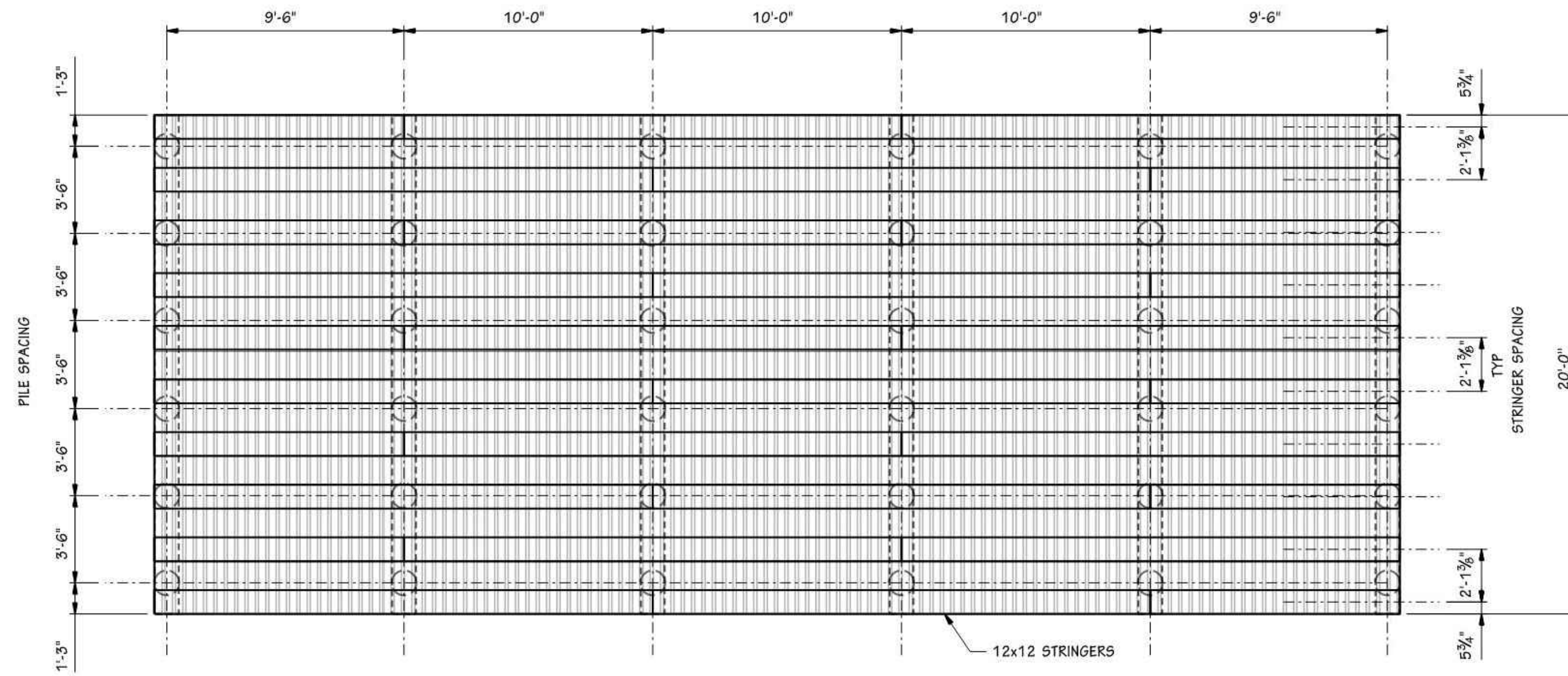
**WLS ENGINEERING PLLC**  
 6 DULA SPRINGS RD., WEAVERVILLE, NC 28787  
 FIRM LICENSE NO. P-1480

DRAWING INFO	
DESIGNED BY:	KMV
DRAWN BY:	MDO
APPROVED BY:	TG
SCALE:	AS NOTED
DATE:	11/30/2023
PROJECT NO.:	23-010

**PROJECT NAME**  
 SCOUT MOTORS BLYTHEWOOD FACILITY  
 PERMITTEE-RESPONSIBLE MITIGATION PLAN  
 RICHLAND COUNTY, SOUTH CAROLINA

**SHEET NAME**  
 DETAILS

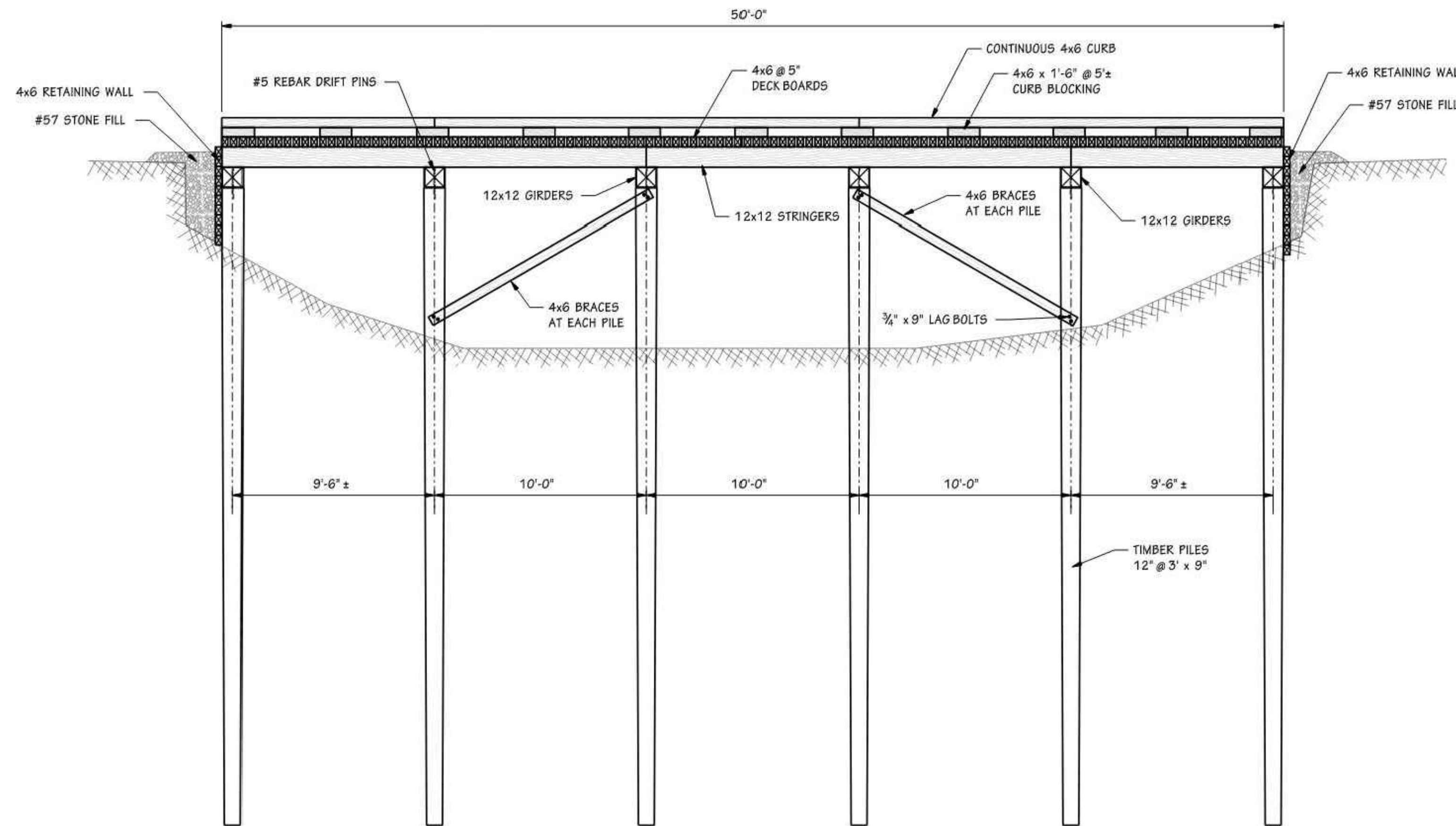




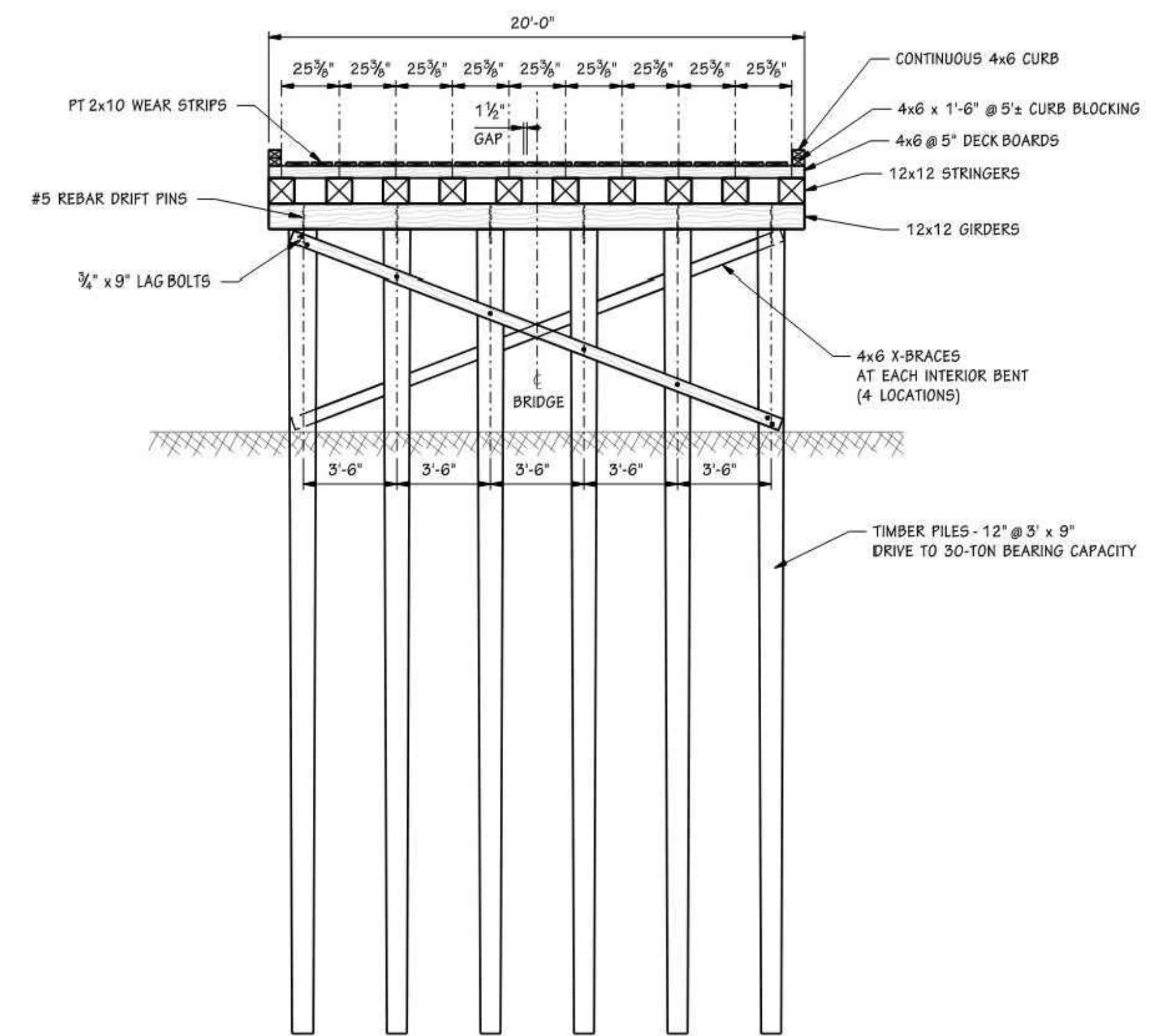
1 PLAN VIEW - STRINGER LAYOUT  
SCALE: 1" = 4'-0"

NOTES:

- DESIGN STANDARD: USDA FOREST SERVICE TIMBER BRIDGE MANUAL.
- ROUND TIMBER PILES SHALL BE SOUTHERN PINE OR DOUGLAS FIR AND SHALL CONFORM TO ASTM D 25. UNUSUED, CLEAN PEELED, UNIFORMLY TAPERED, ONE PIECE FROM BUTT TO TIP. PRESSURE TREATMENT SHALL BE IN ACCORDANCE WITH AWPA USE CATEGORY STANDARDS: UC4C.
- ALL BENT CAPS & STRINGERS SHALL BE PRESSURE TREATED TO USE CATEGORY UC4C.
- ALL DECK BOARDS SHALL BE PRESSURE TREATED TO USE CATEGORY UC4B, OR GREATER.
- ALL TIMBER FOR RETAINING/BULKHEAD WALLS SHALL BE TREATED TO UC4B, OR GREATER.
- ALL HARDWARE (BOLTS, NUTS, SCREWS, WASHERS, SPIKES, ETC.) SHALL BE HOT-DIP GALVANIZED OR STAINLESS STEEL.
- FIELD TREAT ALL SAWCUTS AND BORED HOLES WITH COPPER NAPHTHENATE, OR SIMILAR TREATMENT.



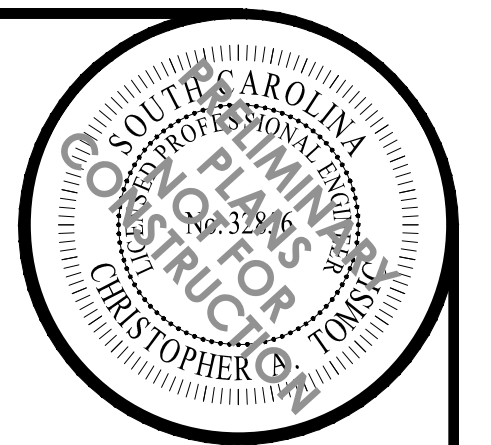
2 SIDE VIEW  
SCALE: 1" = 4'-0"



3 TRANSVERSE SECTION  
SCALE: 1" = 4'-0"

TYPICAL TIMBER BRIDGE SECTION  
NOT TO SCALE

Permitted Plans



NO.	DESCRIPTION	DATE
1	FMP	11/30/2023

**WATER & LAND SOLUTIONS**  
1859 Summerville Avenue, Suite 770  
Charleston, SC 29405  
(919) 552-7253  
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**WLS ENGINEERING PLLC**  
6 DULA SPRINGS RD., WEAVERVILLE, NC 28787  
FIRM LICENSE NO. P-1480

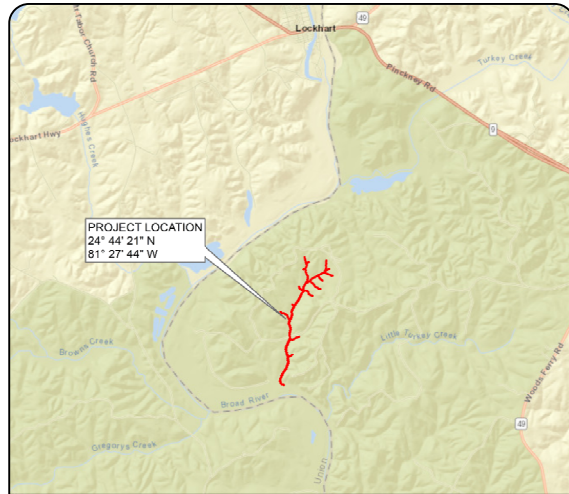
DESIGNED BY:	CMV	MDO	TG
DRAWN BY:			
APPROVED BY:			
SCALE:	AS NOTED		
DATE:	11/30/2023		
PROJECT NO.:	23-010		

**PROJECT NAME**  
SCOUT MOTORS BLYTHEWOOD FACILITY  
PERMITTEE-RESPONSIBLE MITIGATION PLAN  
RICHLAND COUNTY, SOUTH CAROLINA

**SHEET NAME**  
DETAILS



SUMTER NATIONAL FOREST ENROEE RANGER DISTRICT STREAM AND RIPARIAN RESTORATION/ENHANCEMENT PROJECT



VICINITY MAP

INDEX OF SHEETS

- 1... TITLE SHEET
- 1A... STREAM CONVENTIONAL SYMBOLS  
GENERAL NOTES
- 2... TYPICAL SECTIONS
- 2A-2M... DETAILS
- 3A... TABLES
- 4-11... PLAN VIEW

# SC DEPARTMENT OF COMMERCE FOR SCOUT MOTORS

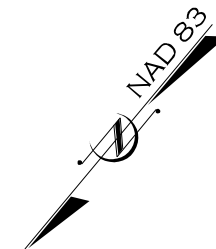
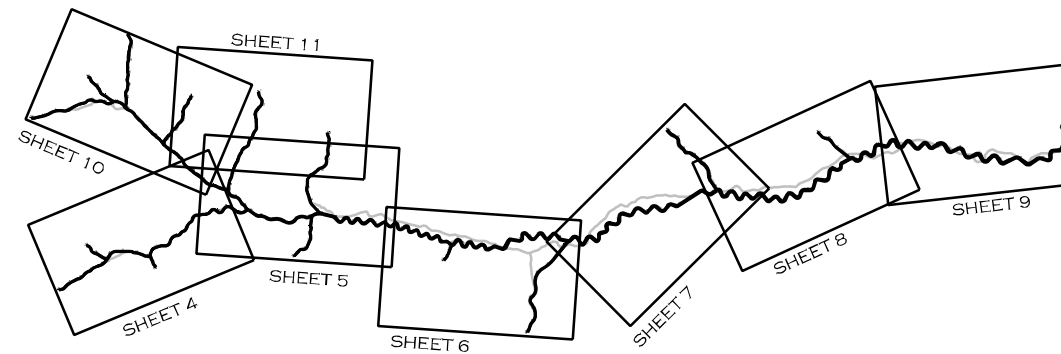
# CHESTER COUNTY

LOCATION: McCLUNEY BRANCH, CHESTER COUNTY, SC  
TYPE OF WORK: STREAM RESTORATION AND  
STREAM ENHANCEMENT

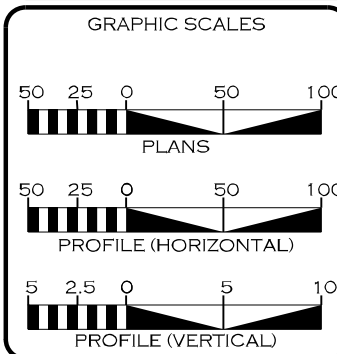
USACE PERMIT NO: SAS-2023-00690

STATE	PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
SC	EPR0002	1	25

PROPOSED DESIGN STREAM LENGTH
EXISTING STREAM LENGTH = 16,953'
PROPOSED STREAM LENGTH = 17,882'



Permitted Plans



REVISIONS				
NO.	DESCRIPTION	ENGR.	APPROV.	DATE
1	PERMITTING DESIGN PLANS	EB	KLT	10/25/23

PREPARED FOR:

SC DEPARTMENT OF COMMERCE  
FOR SCOUT MOTORS

PREPARED IN THE OFFICE OF:

ECOSYSTEM  
PLANNING &  
RESTORATION

1150 SE MAYNARD RD  
SUITE 140  
CARY, NC 27511  
LICENSE # 5371

LETTING DATE: \_\_\_\_\_

ERIN BENNETT, PE  
PROJECT ENGINEER

PROJECT ENGINEER













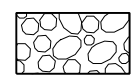




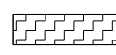
PROGRESS DRAWING  
FOR REVIEW PURPOSES ONLY  
DO NOT USE FOR CONSTRUCTION

SIGNATURE: \_\_\_\_\_ P.E.



SYMBOLY /  
NOTES

STREAM CONVENTIONAL SYMBOLS

	ROCK J-HOOK	(JH)	— SF —	SAFETY FENCE
	ROCK VANE	(RV)	— TP —	TAPE FENCE
	OFFSET ROCK CROSS VANE	(OV)	—     —	SILT FENCE
	GRADE CONTROL J-HOOK VANE	(RJH)	— CE —	CONSERVATION EASEMENT
	ROCK CROSS VANE	(XV)	-- 20 --	EXISTING MAJOR CONTOUR
	TEMPORARY SILT CHECK		-----	EXISTING MINOR CONTOUR
	ROOT WAD	(RW)	-----	LIMITS OF DISTURBANCE
	LOG J-HOOK	(JH)	--- 10+00 ---	BANKFULL BENCH (GRADE)
	LOG VANE	(LV)	————	STREAM THALWEG
	LOG STEP	(LS)	————	STREAM TOP OF BANKS
	ROCK STEP	(RS)	))	FOOT BRIDGE
	LOG CROSS VANE	(XV)		TEMPORARY STREAM CROSSING
	CONSTRUCTED RIFFLE	(CR)		PERMANENT STREAM CROSSING
	CONSTRUCTED CASCADE	(CC)	⬇	TRANSPLANTED VEGETATION
	WOODY VALLEY GRADE CONTROL	(WV GC)	⊗	TREE REMOVAL
	LOG ROLLER	(LR)	⊕	TREE PROTECTION
	GRADE CONTROL WOODY RIFFLE	(WFR)	⊗	CHANNEL PLUG
	GEOLIFT	(GL)	⊕	CHANNEL FILL / DITCH PLUG
			⊗	GRADE BANK
			AAA	LOG STEP POOL (SP)
				TOEWOOD (TW)
			⌒	SOD MATS (SM)
			⊗	DEBRIS JAM (DJ)
			⌒	JUNCUS PLUG (JP)

\*\*NOTE: ALL ITEMS ABOVE MAY NOT BE USED ON THIS PROJECT

GENERAL NOTES


- NO CONSTRUCTION WORK SHALL COMMENCE BEFORE AN ONSITE MEETING WITH THE ENGINEER, CLIENT, US FOREST SERVICE, AND CONTRACTOR.
- WORK IS BEING PERFORMED AS AN ENVIRONMENTAL RESTORATION PROJECT. THE CONTRACTOR SHALL MAKE ALL REASONABLE EFFORTS TO REDUCE SEDIMENT LOSS AND MINIMIZE DISTURBANCE OF THE SITE WHILE PERFORMING CONSTRUCTION WORK.
- THE CONTRACTOR IS REQUIRED TO INSTALL INSTREAM STRUCTURES USING A TRACK HOE EXCAVATOR WITH A HYDRAULIC THUMB OF SUFFICIENT SIZE TO PLACE BOULDERS AND STRUCTURES.
- CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL UTILITIES ARE ADEQUATELY LOCATED AND MARKED DURING CONSTRUCTION.
- ANY DAMAGE TO EXISTING ROADS, STRUCTURES, FACILITIES, ETC. RESULTING FROM ACTIONS OF THE CONTRACTOR WILL BE REPAIRED OR REPLACED AT THE EXPENSE OF THE CONTRACTOR, TO A QUALITY MEETING OR EXCEEDING THE PREVIOUS STANDARDS.
- WORK IS BEING PERFORMED IN A NATIONAL FOREST WITH PUBLIC ACCESS. CONTRACTOR SHALL ENSURE THAT ALL WORK IS CONDUCTED SAFELY, AND THAT THE SAFETY OF THE GENERAL PUBLIC IS ENSURED DURING ALL PHASES OF THE CONSTRUCTION WORK.
- IN THE EVENT OF A SPILL OR ILLICIT DISCHARGE, CONTACT THE ENOREE RANGER DISTRICT OFFICE AT (803) 276-4810.
- CONTRACTOR SHALL INSPECT ALL SAFETY AND EROSION CONTROL DEVICES, STRUCTURES, AND WORKS AT THE START OF EACH WORK DAY TO ENSURE THEY ARE PROPERLY PLACED AND FUNCTIONING.
- CONTRACTOR SHALL MAINTAIN ALL VEHICLES AND EQUIPMENT TO PREVENT DISCHARGE OF FUEL OR FLUIDS. ANY IDENTIFIED LEAKING EQUIPMENT SHALL BE REMOVED FROM THE WORK AREA AND SHALL BE REPAIRED AS SOON AS FEASIBLE.

Permitted Plans

10/25/2023  
L:\PROJECTS\EPRO002\SUMTER FOREST\PRM PROJECT\CADD\PLANS\McCLUNEY BRANCH\SF\_MB\_PSH\_L1A.dgn  
MKOON

REVISIONS				
NO.	DESCRIPTION	ENGR.	APPROV.	DATE
1	PERMITTING DESIGN PLANS	EB	KLT	10/25/23

PREPARED FOR:



SC DEPARTMENT OF COMMERCE  
FOR SCOUT MOTORS

SUMTER NATIONAL FOREST  
ENROEE RANGER DISTRICT  
STREAM AND RIPARIAN RESTORATION/  
ENHANCEMENT PROJECT  
McCLUNEY BRANCH WATERSHED  
CHESTER COUNTY, SOUTH CAROLINA

PREPARED IN THE OFFICE OF:



1150 SE MAYNARD RD, SUITE 140  
CARY, NC 27511  
LICENSE # 5371

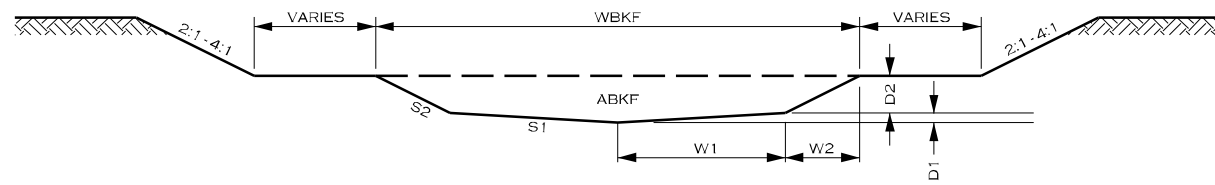
PROJECT ENGINEER

PROGRESS DRAWING  
FOR REVIEW PURPOSES ONLY  
DO NOT USE FOR CONSTRUCTION

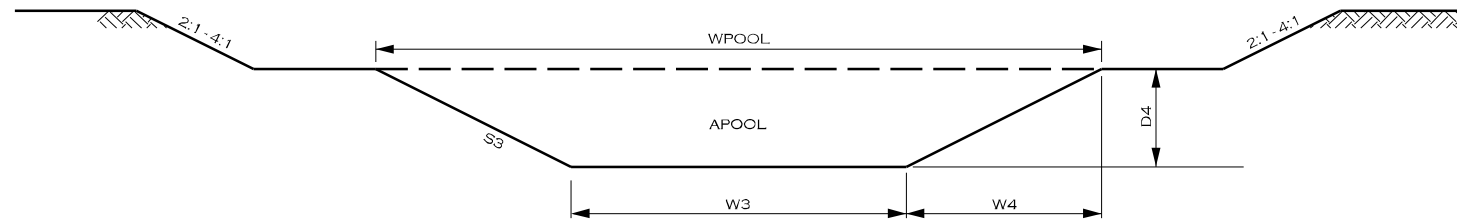
TYPICAL SECTIONS

DETAILS

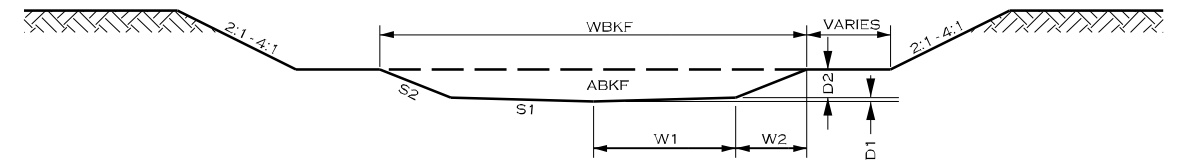
"B" AND "Bc" TYPE CHANNELS



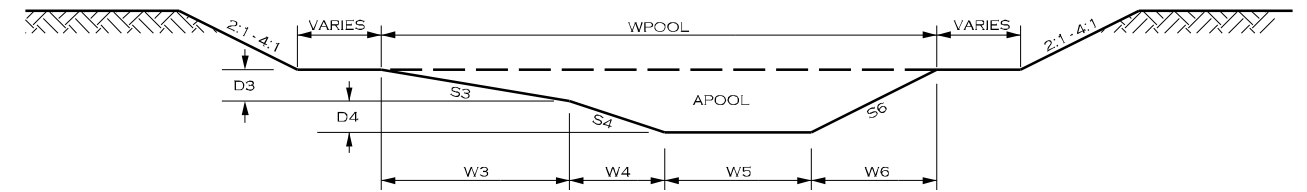
TYPICAL RIFFLE CROSS SECTION



"C", "Cb", AND "E" TYPE CHANNELS



TYPICAL RIFFLE CROSS SECTION



TYPICAL POOL RIGHT CROSS SECTION

C, Cb, E STREAM, and MEANDERING TYPE REPRESENTATIVE CROSS SECTION DIMENSIONS

Stream	Sheet Range	Station Range	RIFFLES								POOLS										
			ABKF	WBKF	W1	W2	D1	D2	S1	S2	APOOL	WPOOL	W3	W4	W5	W6	D3	D4	S3	S4	S6
MB-R6	5-6	34+07.00 - 46+87.83	7.9	9.7	2.2	2.7	0.14	1.08	16:1	2.5:1	19.3	14.6	4.9	2.4	2.4	4.9	1.22	1.22	4:1	2:1	2:1
MB-R7	6-7	46+87.83 - 74+30.60	11.6	11.8	2.6	3.3	0.16	1.31	16:1	2.5:1	28.3	17.7	5.9	2.9	2.9	5.9	1.47	1.47	4:1	2:1	2:1
MB-R8	7-8	74+30.60 - 88+82.30	13.4	12.7	2.8	3.5	0.18	1.41	16:1	2.5:1	32.7	19.0	6.3	3.2	3.2	6.3	1.59	1.59	4:1	2:1	2:1
MB-R9-1	8-9	88+82.30 - 100+77.82	15.3	13.5	3.0	3.8	0.19	1.51	16:1	2.5:1	37.3	20.3	6.8	3.4	3.4	6.8	1.69	1.69	4:1	2:1	2:1
MB-R9-2	9	100+77.82 - 112+63.81	15.3	13.5	3.0	3.8	0.19	1.51	16:1	2.5:1	37.3	20.3	6.8	3.4	3.4	6.8	1.69	1.69	4:1	2:1	2:1

B, Bc, and STEP-POOL STREAM TYPE REPRESENTATIVE CROSS SECTION DIMENSIONS

Stream	Sheet Range	Station Range	RIFFLES								POOLS					
			ABKF	WBKF	W1	W2	D1	D2	S1	S2	APOOL	WPOOL	W3	W4	D4	S3
MB-R1	4	10+00.00 - 14+28.89	2.1	5.0	1.1	1.4	0.07	0.56	16:1	2.5:1	4.6	7.5	1.0	3.3	1.09	3:1
MB-R2	4	14+28.89 - 18+19.83	2.1	5.0	1.1	1.4	0.07	0.56	16:1	2.5:1	4.6	7.5	1.0	3.3	1.09	3:1
MB-R3	4-5	18+19.83 - 27+94.16	2.8	5.8	1.3	1.6	0.08	0.64	16:1	2.5:1	6.2	8.7	1.2	3.8	1.26	3:1
MB-R4	5	27+94.16 - 33+25.16	6.1	8.6	1.9	2.4	0.12	0.95	16:1	2.5:1	13.5	12.8	1.7	5.6	1.85	3:1
MB-R5	5	33+25.16 - 34+07.00	6.9	9.1	2.0	2.5	0.13	1.01	16:1	2.5:1	15.2	13.6	1.8	5.9	1.97	3:1
MB-UT1	4	10+00.00 - 12+04.23	2.1	5.0	1.1	1.4	0.07	0.56	16:1	2.5:1	4.6	7.5	1.0	3.3	1.09	3:1
MB-UT2	4	10+00.00 - 11+06.25	2.1	5.0	1.1	1.4	0.07	0.56	16:1	2.5:1	4.6	7.5	1.0	3.3	1.09	3:1
MB-UT3-R1	10	10+00.00 - 18+18.92	2.1	5.0	1.1	1.4	0.07	0.56	16:1	2.5:1	4.6	7.5	1.0	3.3	1.09	3:1
MB-UT3-R1a	10	10+00.00 - 13+02.36	2.1	5.0	1.1	1.4	0.07	0.56	16:1	2.5:1	4.6	7.5	1.0	3.3	1.09	3:1
MB-UT3-R1b	10	10+00.00 - 15+97.09	2.1	5.0	1.1	1.4	0.07	0.56	16:1	2.5:1	4.6	7.5	1.0	3.3	1.09	3:1
MB-UT3-R2	10	18+18.92 - 22+08.76	2.8	5.8	1.3	1.6	0.08	0.64	16:1	2.5:1	6.2	8.7	1.2	3.8	1.26	3:1
MB-UT3-R2a	10	10+00.00 - 14+52.41	2.1	5.0	1.1	1.4	0.07	0.56	16:1	2.5:1	4.6	7.5	1.0	3.3	1.09	3:1
MB-UT3-R3	10, 5	22+08.76 - 28+34.57	3.8	6.8	1.5	1.9	0.09	0.75	16:1	2.5:1	8.4	10.1	1.4	4.4	1.46	3:1
MB-UT3-R3a	11, 5	10+00.00 - 18+58.40	2.1	5.0	1.1	1.4	0.07	0.56	16:1	2.5:1	4.6	7.5	1.0	3.3	1.09	3:1
MB-UT3-R4	5	28+34.57 - 30+47.71	4.5	7.3	1.6	2.0	0.10	0.82	16:1	2.5:1	9.9	11.0	1.5	4.8	1.59	3:1
MB-UT4	5	10+00.00 - 13+81.45	2.2	5.1	1.1	1.4	0.07	0.57	16:1	2.5:1	4.9	7.7	1.0	3.3	1.11	3:1
MB-UT5	11, 5	10+00.00 - 17+32.67	2.1	5.0	1.1	1.4	0.07	0.56	16:1	2.5:1	4.6	7.5	1.0	3.3	1.09	3:1
MB-UT6	6	10+00.00 - 11+34.55	2.7	5.7	1.3	1.6	0.08	0.63	16:1	2.5:1	6.0	8.5	1.1	3.7	1.23	3:1
MB-UT7	7	10+00.00 - 16+33.11	4.2	7.1	1.6	2.0	0.10	0.79	16:1	2.5:1	9.3	10.6	1.4	4.6	1.54	3:1
MB-UT8	8	10+00.00 - 13+30.03	2.1	5.0	1.1	1.4	0.07	0.56	16:1	2.5:1	4.6	7.5	1.0	3.3	1.09	3:1
MB-UT9	6	10+00.00 - 18+37.92	3.2	6.2	1.4	1.7	0.09	0.69	16:1	2.5:1	7.1	9.3	1.2	4.0	1.34	3:1

Permitted Plans

REVISIONS

NO.	DESCRIPTION	ENGR.	APPROV.	DATE
1	PERMITTING DESIGN PLANS	EB	KLT	10/25/23

PREPARED FOR:



SUMTER NATIONAL FOREST  
ENROEE RANGER DISTRICT  
STREAM AND RIPARIAN RESTORATION/  
ENHANCEMENT PROJECT  
MCCUNEY BRANCH WATERSHED  
CHESTER COUNTY, SOUTH CAROLINA

PREPARED IN THE OFFICE OF:



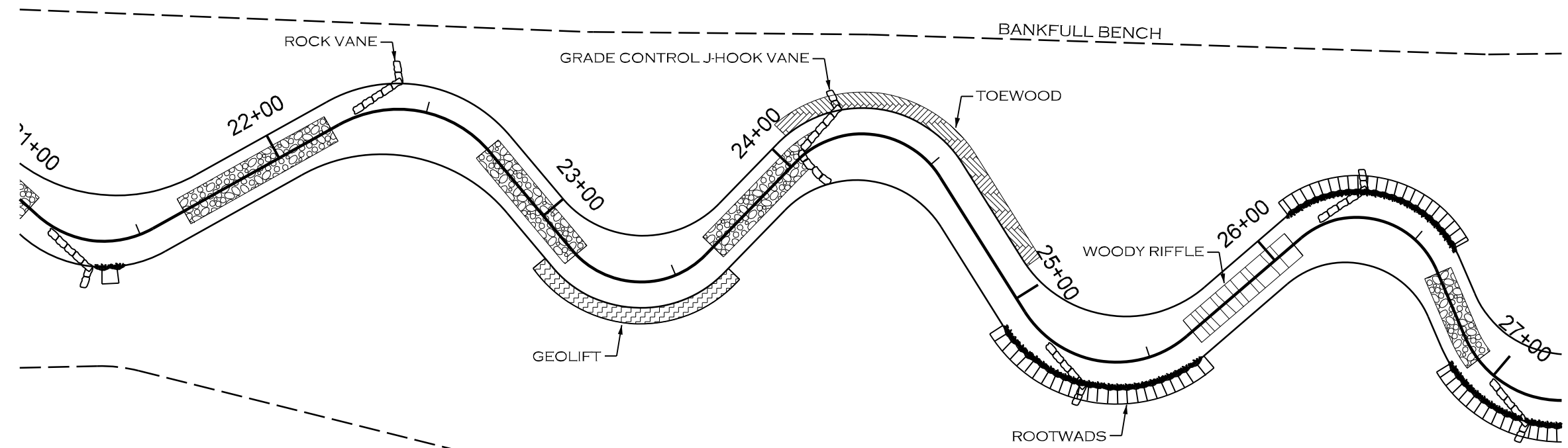
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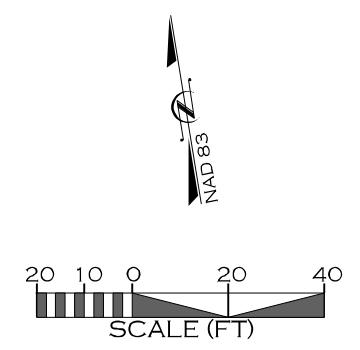


TYPICAL STRUCTURE PLACEMENT  
MEANDERING CHANNEL DESIGN

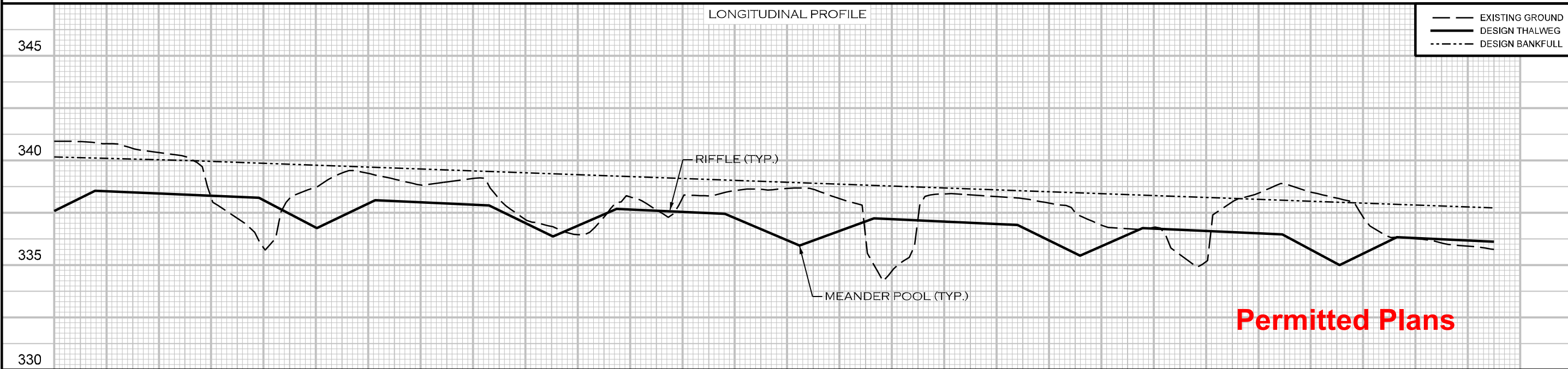


NOTES:

1. THIS DETAIL ILLUSTRATES TYPICAL PLACEMENT OF IN-STREAM AND BANK PROTECTION STRUCTURES TO BE USED IN MEANDERING CHANNEL DESIGNS. PLACEMENT AND TYPES OF STRUCTURES MAY VARY.
2. MEANDERING CHANNEL STRUCTURES ARE TYPICALLY USED FOR BANK PROTECTION, HABITAT, AND GRADE CONTROL, AND TYPICALLY FOR REACHES EQUAL TO OR LESS THAN 1.5% SLOPE.
3. GRADE CONTROL STRUCTURES SHALL BE PLACED TO PREVENT PIPING, EXCESSIVE SCOUR, AND STREAM INCISION AROUND STRUCTURE.
4. SEE DETAILS FOR SPECIFIC STRUCTURES FOR MORE INFORMATION.



LONGITUDINAL PROFILE



21+50      22+00      23+00      24+00      25+00      26+00      27+00

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1	PERMITTING DESIGN PLANS	EB	KLT	10/25/23

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PREPARED IN THE OFFICE OF:

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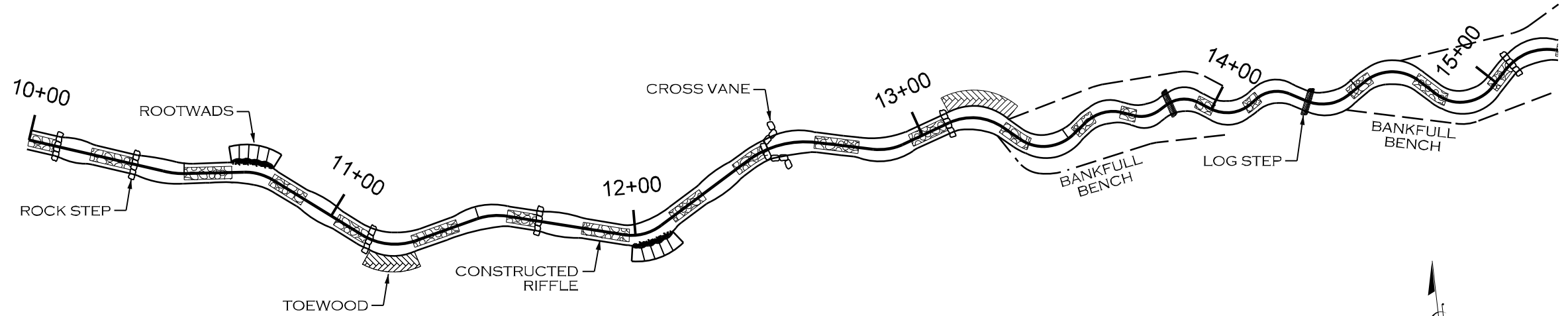
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TYPICAL STRUCTURE PLACEMENT  
STEP - POOL CHANNEL DESIGN

PROJECT #  
EPRO002

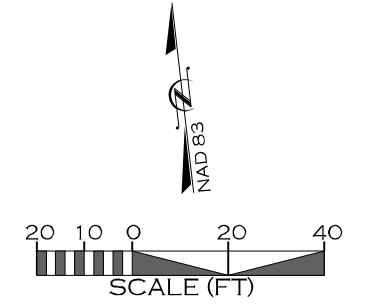
SHEET NO.  
2B

DETAILS

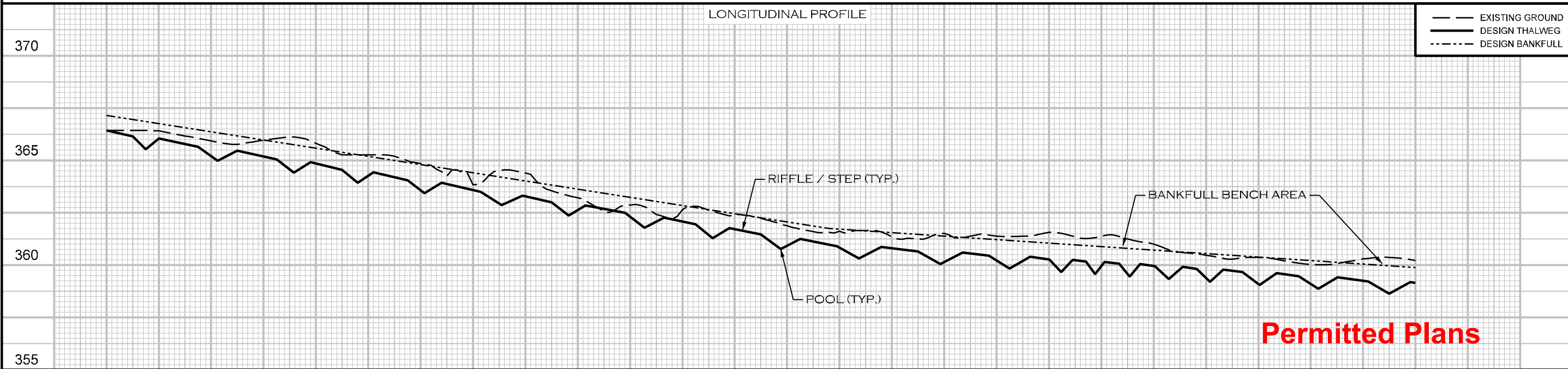


NOTES:

1. THIS DETAIL ILLUSTRATES TYPICAL PLACEMENT OF IN-STREAM AND BANK PROTECTION STRUCTURES TO BE USED IN STEP-POOL CHANNEL DESIGNS. PLACEMENT AND TYPES OF STRUCTURES MAY VARY.
2. STEP-POOL STRUCTURES ARE TYPICALLY USED FOR REACHES WITH SLOPES IN EXCESS OF 1.5%.
3. GRADE CONTROL STRUCTURES SHALL BE PLACED TO PREVENT PIPING, EXCESSIVE SCOUR, AND STREAM INCISION AROUND STRUCTURE
4. SEE DETAILS FOR SPECIFIC STRUCTURES FOR MORE INFORMATION.



LONGITUDINAL PROFILE



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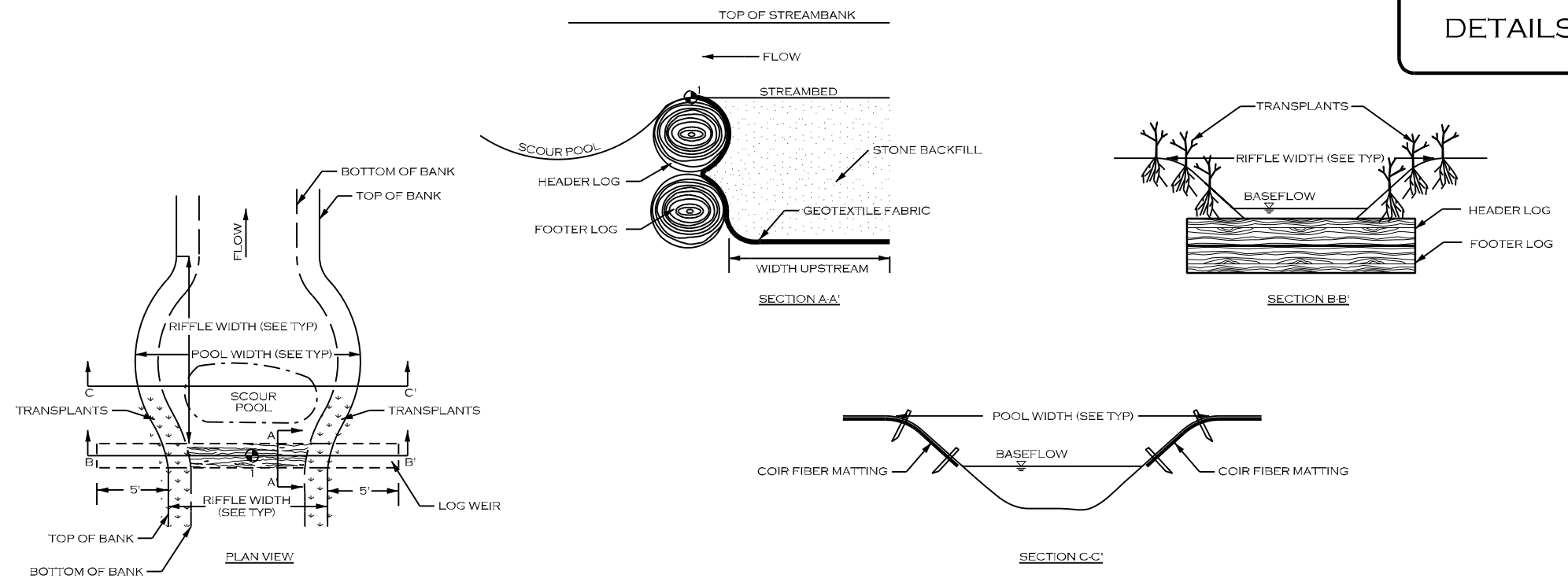
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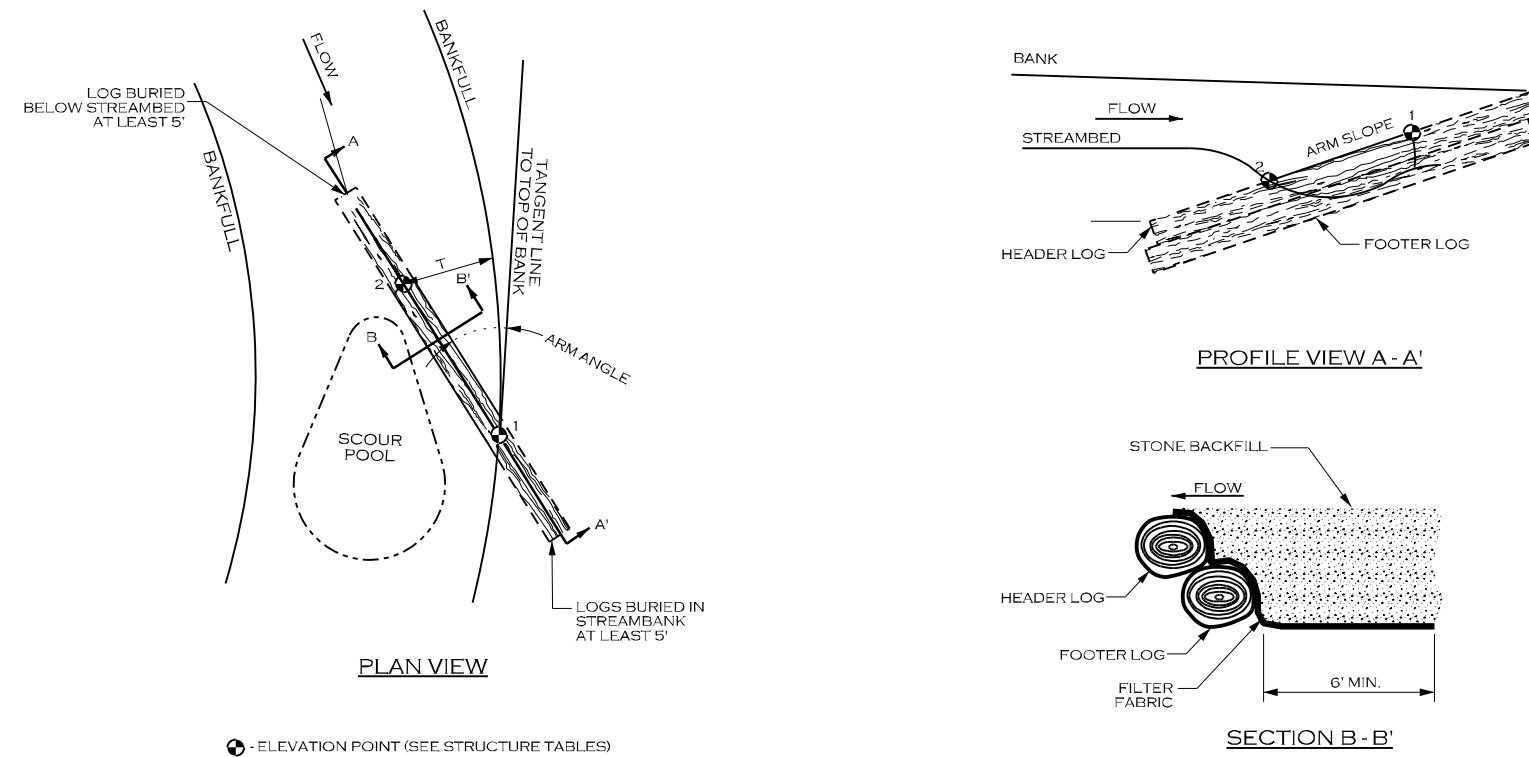
⊙ - ELEVATION POINT (SEE STRUCTURES TABLE)

LOG STEP SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
LOGS	TYPE: HARDWOOD SIZE: 20 FT LONG, 12 INCH Ø MIN NUMBER OF HEADER LOGS: 1 NUMBER OF FOOTER LOGS: 1
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
<b>NOTES FOR LOG STEP STRUCTURES:</b> 1. LOGS SHOULD BE AT LEAST 12 INCHES IN DIAMETER, RELATIVELY STRAIGHT, HARDWOOD, AND RECENTLY HARVESTED. 2. LOGS >24 INCHES IN DIAMETER MAY BE USED ALONE WITHOUT AN ADDITIONAL LOG. GEOTEXTILE FABRIC SHOULD STILL BE USED TO SEAL AROUND LOG. 3. PLACE FOOTER LOGS FIRST AND THEN HEADER (TOP) LOG. SET HEADER LOG APPROXIMATELY 3 INCHES ABOVE THE INVERT ELEVATION. 4. CUT A NOTCH IN THE HEADER LOG APPROXIMATELY 50 PERCENT OF THE CHANNEL BOTTOM WIDTH AND EXTENDING DOWN TO THE INVERT ELEVATION. 5. USE GEOTEXTILE FABRIC TO SEAL GAPS BETWEEN LOGS. 6. PLACE TRANSPLANTS FROM TOE OF STREAMBANK TO TOP OF STREAMBANK. 7. TRANSPLANTS CAN BE SUBSTITUTED WITH LIVE STAKES AT THE DIRECTION OF THE ENGINEER.	



LOG VANE (LV)

LOG VANE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
LOGS	TYPE: HARDWOOD SIZE: SEE NOTES. NUMBER OF HEADER LOGS: 1 NUMBER OF FOOTER LOGS: 1
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
STONE BACKFILL	CLASS A AND 57 STONE (50/50 MIX)
<b>NOTES FOR LOG VANE STRUCTURES:</b> 1. STRUCTURE DIMENSIONS AND STRUCTURE MEASUREMENTS ARE SHOWN ON THE STRUCTURE TABLES SHEET. 2. LOGS SHOULD BE STRAIGHT, HARDWOOD, AND NOT ROTTEN. 3. SOIL SHOULD BE COMPACTED WELL AROUND BURIED PORTIONS OF LOGS. 4. FILTER FABRIC SHOULD BE NAILED TO THE LOG BELOW THE BACKFILL. 5. LOGS 12 INCH DIAMETER MINIMUM.	



⊙ - ELEVATION POINT (SEE STRUCTURE TABLES)

Permitted Plans

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CHESTER COUNTY, SOUTH CAROLINA

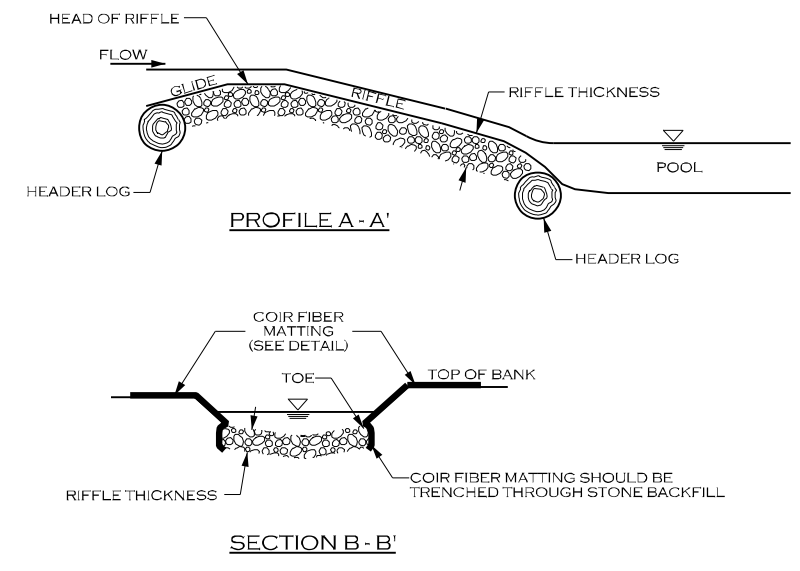
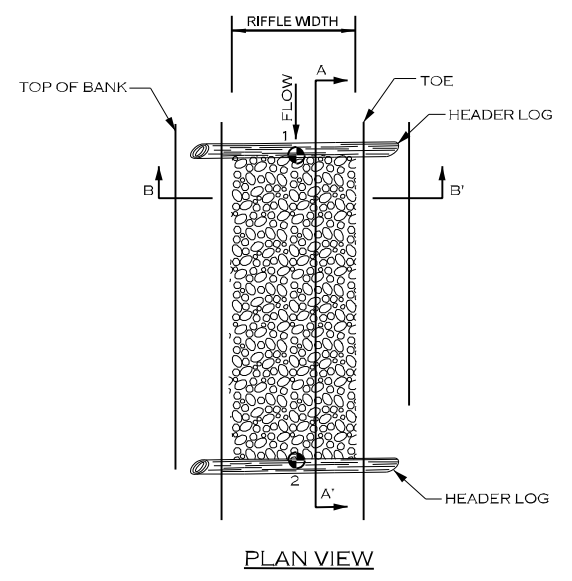
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CONSTRUCTED RIFFLE (CR)



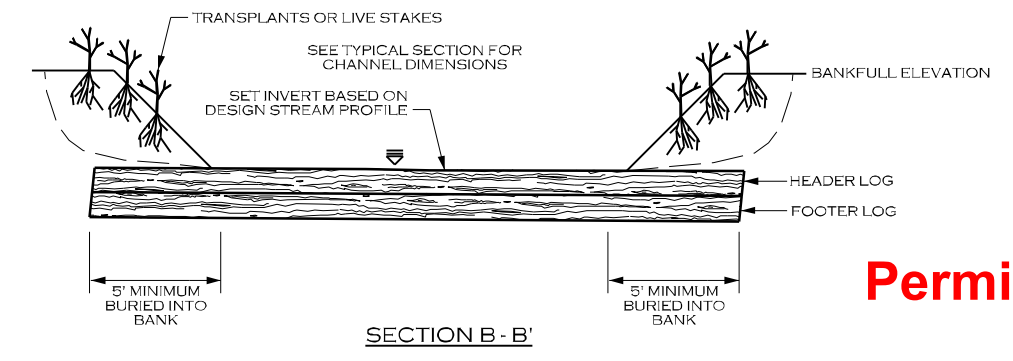
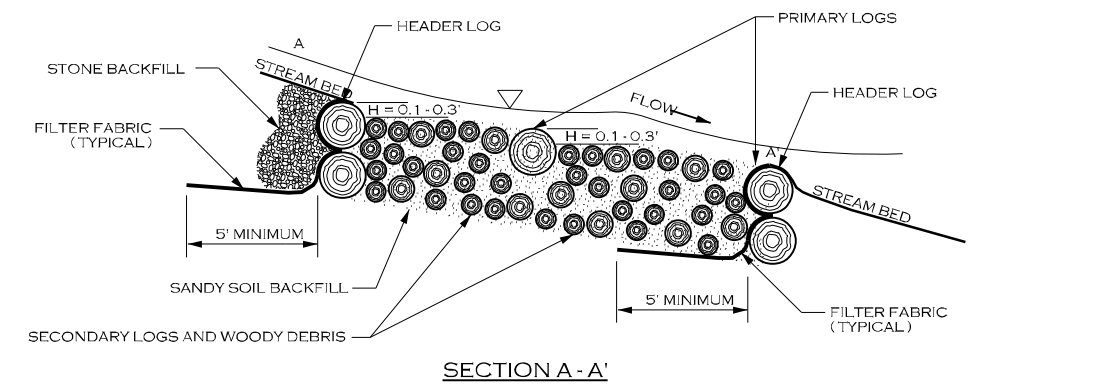
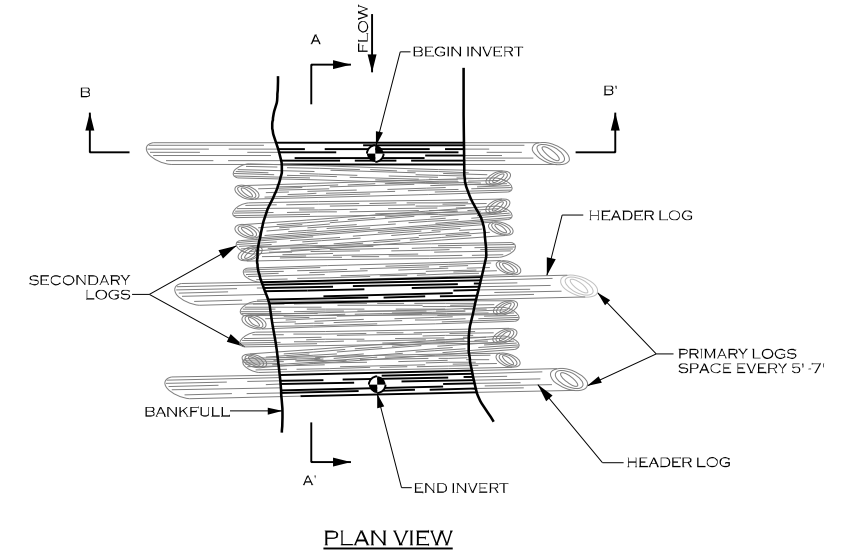
CONSTRUCTED RIFFLE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
STONE BACKFILL	TYPE: GRANITE OR COMPARABLE SIZE: CLASS A AND CLASS B STONE (50/50 MIX) THICKNESS: 16 INCHES MIN.
COIR FIBER MATTING	SEE MATTING DETAIL

NOTES FOR CONSTRUCTED RIFFLE STRUCTURES:

- GRADE STREAMBED AND BANKS TO PROPOSED DIMENSIONS PER TYPICAL CROSS SECTION AND PROFILE.
- EXCAVATE TRENCH BELOW PROPOSED STREAMBED ELEVATION EQUAL TO OR GREATER THAN RIFFLE THICKNESS.
- INSTALL COIR FIBER MATTING ALONG STREAMBANKS ENSURING MATTING IS SUFFICIENTLY TRENCHED ALONG TOP OF BANK.
- FILL TRENCH WITH STONE TO FINAL DESIGN STREAM GRADE.

• ELEVATION POINT (SEE STRUCTURES TABLE)

GRADE CONTROL WOODY RIFFLE (WR)



- NOTES:
- PRIMARY LOGS SHOULD BE AT LEAST 10" OR MORE IN DIAMETER, RELATIVELY STRAIGHT, AND RECENTLY HARVESTED AND EXTENDING INTO THE BANK 5' ON EACH SIDE.
  - SECONDARY LOGS SHOULD BE AT LEAST 1" IN DIAMETER AND NO LARGER THAN 10", AND EXTEND INTO THE BANK 2 FEET ON EACH SIDE. WOOD MATERIAL SHALL BE VARYING DIAMETER TO ALLOW MATERIAL TO BE COMPACTED.
  - FILTER FABRIC SHOULD BE NAILED TO THE HEADER LOG BELOW THE BACKFILL.
  - ROOTWADS AND COIR FIBER MATTING CAN BE USED INSTEAD OF TRANSPLANTS OR LIVE STAKES, PER DIRECTION OF ENGINEER.
  - AFTER TRENCH HAS BEEN EXCAVATED A LAYER OF SECONDARY LOGS AND WOODY DEBRIS SHOULD BE PLACED WITH MINIMAL GAPS. A LAYER OF ON-SITE ALLUVIUM SHOULD BE APPLIED TO FILL VOIDS BETWEEN SECONDARY LOGS BEFORE ADDITIONAL LAYERS ARE PLACED.

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LICENSE # 5371

PROJECT ENGINEER

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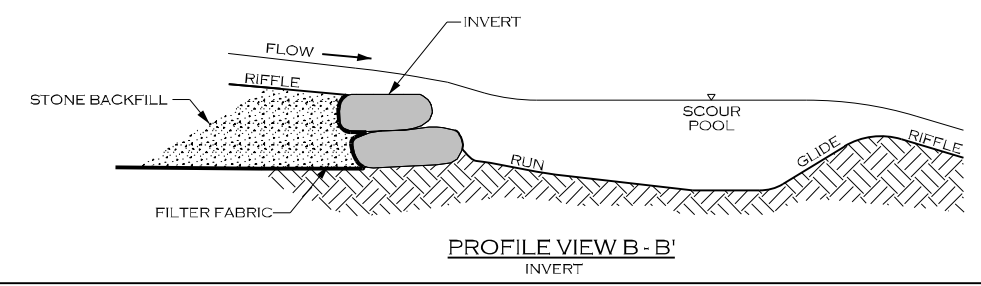
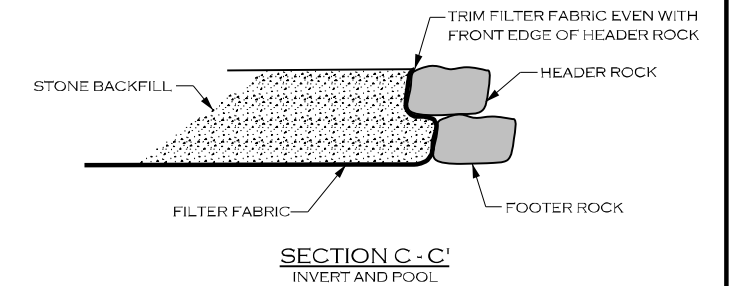
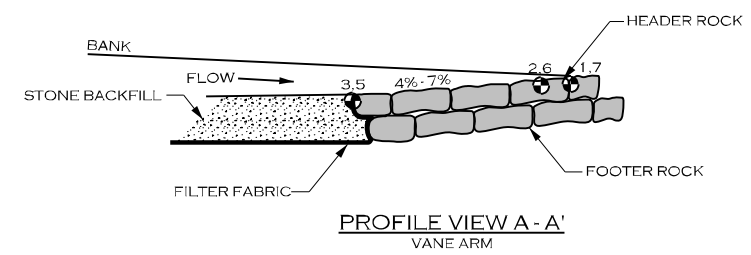
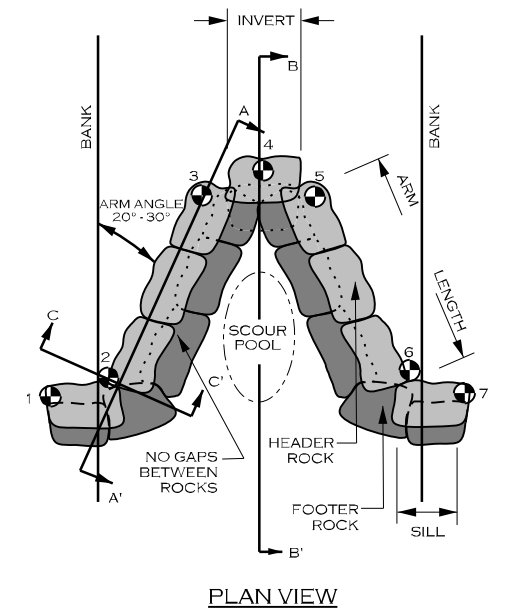
DETAILS

⊙ - ELEVATION POINT (SEE STRUCTURE TABLES)

ROCK CROSS VANE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
BOULDER	TYPE: GRANITE OR COMPARABLE SIZE: 3 x 2 x 2 FT NUMBER OF HEADER ROWS: 1 NUMBER OF FOOTER ROWS: 1
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
STONE BACKFILL	CLASS A AND 57 STONE (50/50 MIX)

**NOTES FOR CROSS VANE STRUCTURES:**

- STRUCTURE DIMENSIONS AND MEASUREMENTS ARE SHOWN ON THE STRUCTURE TABLES.
- DIG A TRENCH BELOW THE STREAM BED FOR FOOTER AND HEADER ROCKS, FILTER FABRIC AND STONE BACKFILL.
- PLACE FOOTER ROCKS AND THEN HEADER ROCKS TO ACHIEVE DESIGN DIMENSIONS AND ELEVATIONS.
- USE HAND PLACED STONE TO FILL GAPS AND VOIDS ON UPSTREAM SIDE OF THE HEADER AND FOOTER ROCKS.
- PLACE FILTER FABRIC BEGINNING AT THE TOP OF THE FOOTER ROCKS AND EXTENDING DOWN TO THE DEPTH OF THE FOOTER ROCKS, THEN OUTWARD THE DISTANCE SPECIFIED ABOVE (FILTER FABRIC WIDTH UPSTREAM).
- INSTALL STONE BACKFILL OVER FILTER FABRIC AS SHOWN.
- AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ONSITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.

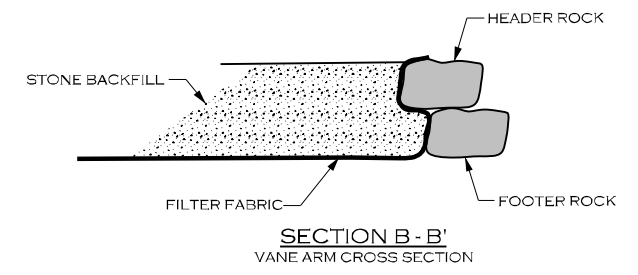
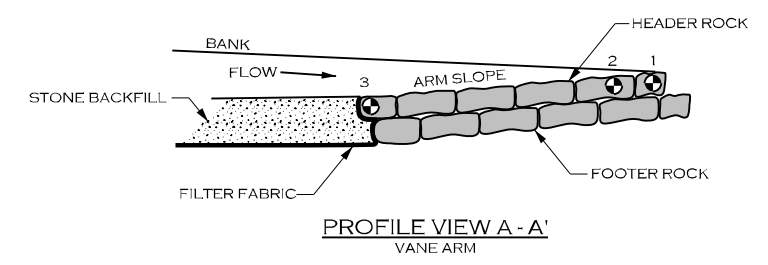
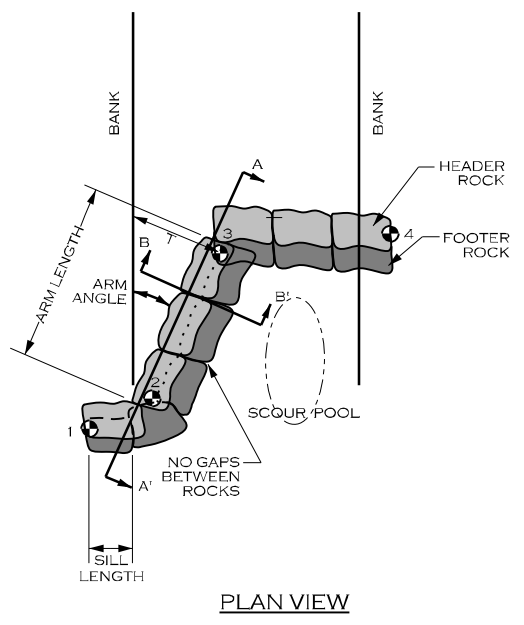


GRADE CONTROL J-HOOK VANE (RJH)

GRADE CONTROL J-HOOK VANE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
BOULDER	TYPE: GRANITE OR COMPARABLE SIZE: 3 x 2 x 2 FT NUMBER OF HEADER ROWS: 1 NUMBER OF FOOTER ROWS: 1
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
STONE BACKFILL	CLASS A AND 57 STONE (50/50 MIX)

**NOTES FOR GRADE CONTROL J-HOOK VANE:**

- STRUCTURE DIMENSIONS AND MEASUREMENTS ARE SHOWN ON THE STRUCTURES TABLE SHEET.
- INSTALL FILTER FABRIC BEGINNING AT THE TOP OF THE HEADER ROCKS AND EXTEND DOWNWARD TO THE DEPTH OF THE BOTTOM FOOTER ROCK, AND THEN UPSTREAM TO A MINIMUM OF TEN FEET.
- DIG A TRENCH BELOW THE BED FOR FOOTER ROCKS AND PLACE FILL ON UPSTREAM SIDE OF VANE ARM, BETWEEN THE ARM AND STREAMBANK.
- START AT BANK AND PLACE FOOTER ROCKS FIRST AND THEN HEADER (TOP) ROCK.
- USE HAND PLACED STONE TO FILL GAPS ON UPSTREAM SIDE OF HEADER AND FOOTER ROCKS.
- INSTALL STONE BACKFILL AS SHOWN, TO THE DIMENSIONS INDICATED IN THE STRUCTURES TABLE SHEET.
- AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ONSITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.



⊙ - ELEVATION POINT (SEE STRUCTURES TABLE)

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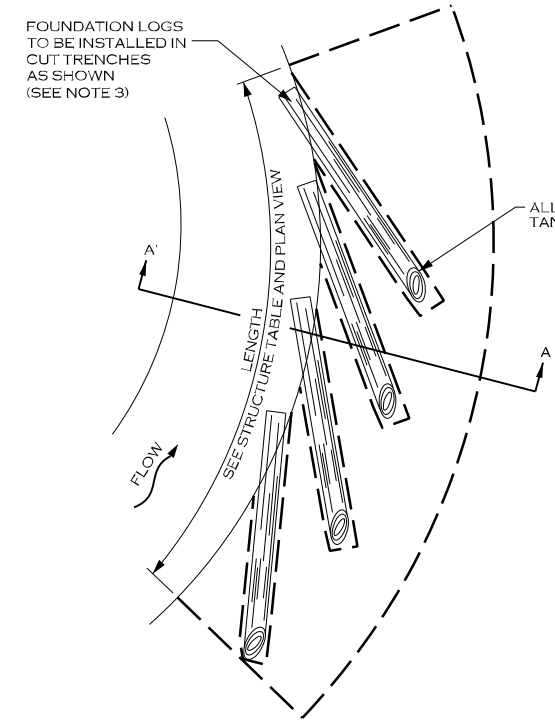
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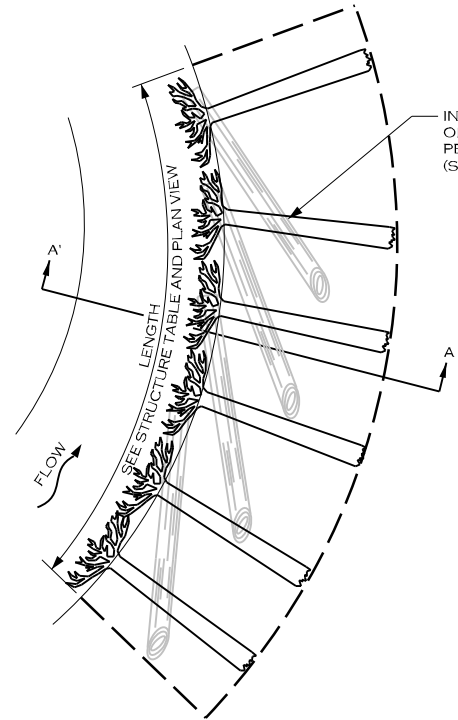
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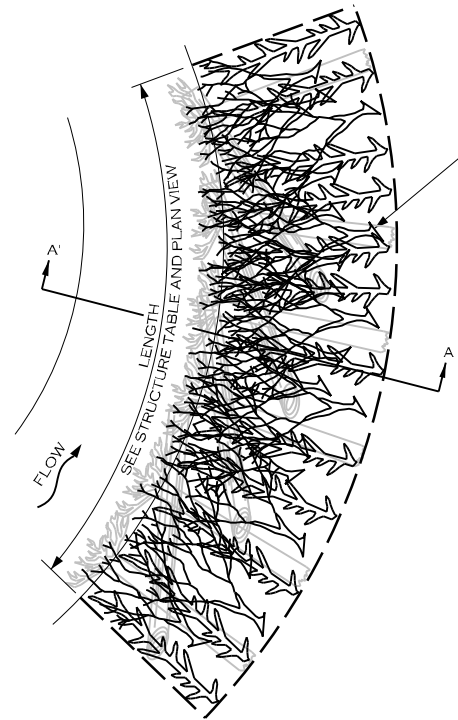
TOE WOOD WITH GEOLIFT <sup>(TW)</sup>



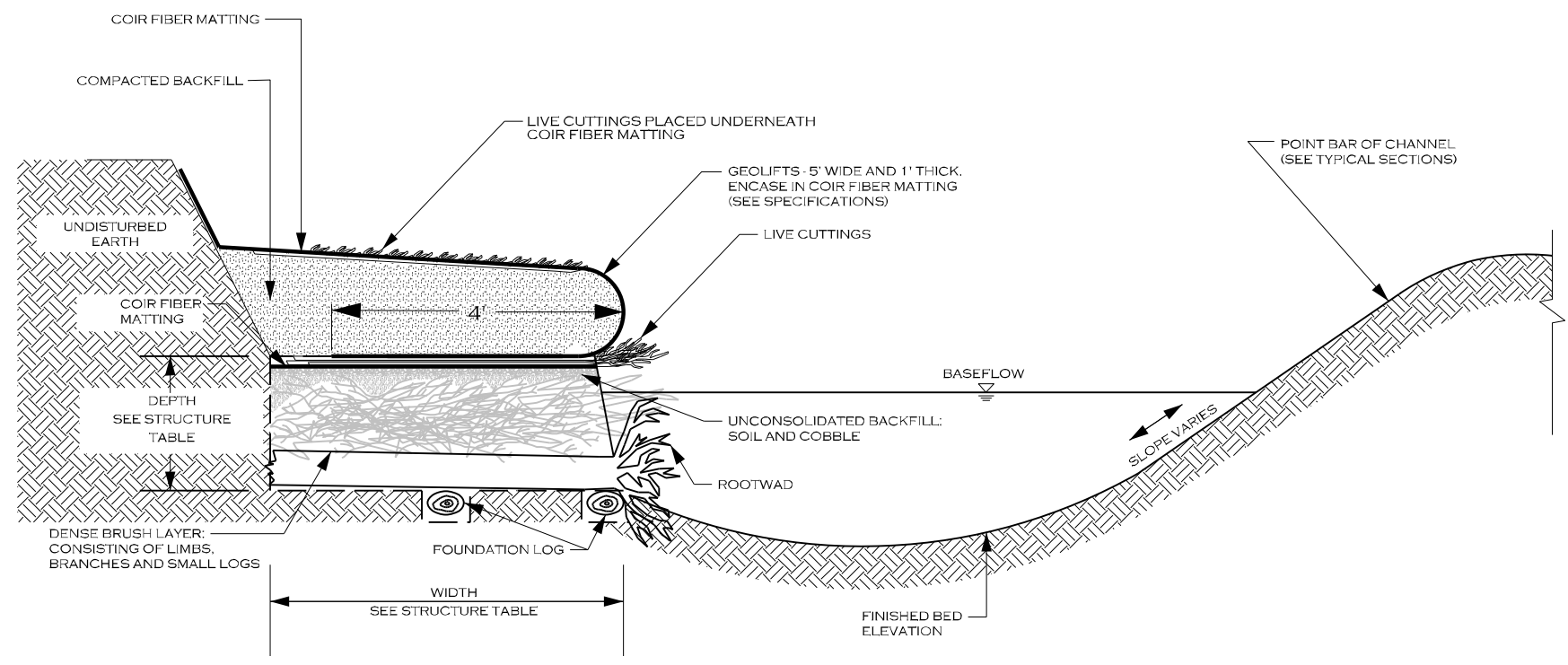
PLAN VIEW - 1  
FOUNDATION LOG INSTALLATION



PLAN VIEW - 2  
ROOTWAD INSTALLATION



PLAN VIEW - 3  
BRUSH LAYER INSTALLATION



SECTION VIEW

Permitted Plans

TOE WOOD SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
BRUSH MATERIAL	TYPE: BRUSH MATERIAL SIZE: 5 FT LONG, 1 INCH DIAMETER
ROOTWAD MATERIAL	TYPE: HARDWOOD SIZE: 6 FT - 10 FT LONG MIN, 12 INCH DIAMETER
FOUNDATION LOGS	TYPE: HARDWOOD SIZE: 6 FT - 10 FT LONG MIN, 12 INCH DIAMETER
COIR FIBER MATTING	TYPE: NETTING (SEE SPECIFICATIONS)

**NOTES FOR TOE WOOD STRUCTURES:**

- DIG A TRENCH ALONG BANK WHERE TOE WOOD IS TO BE INSTALLED, TO THE DEPTH AND WIDTH SPECIFIED IN THE DETAILS AND STRUCTURE TABLE. IF TOE WOOD IS BEING PLACED IN A LOCATION WHERE THERE IS NOT EXISTING GROUND, PLACE FILL MATERIAL AND COMPACT TO FORM THE TRENCH FOR THE TOE WOOD MATERIALS.
- FOUNDATION LOGS SHALL MEET THE MINIMUM DIAMETER LISTED ABOVE, AND BE STRAIGHT, HARDWOOD, AND NOT ROTTEN. EXCAVATE TRENCH BELOW TOEWOOD GRADE FOR FOUNDATION LOG INSTALLATION. PLACE FOUNDATION LOGS AS SHOWN IN THE PLAN VIEW 1 TO FORM A FOUNDATION FOR THE TOE WOOD MATERIALS TO LAY UPON. THE ANGLE BETWEEN THE TANGENT LINE OF THE BANK AND THE UPSTREAM FACE OF THE FOUNDATION LOG SHALL BE BETWEEN 20 TO 30 DEGREES.
- INSTALL ROOTWADS ON TOP OF FOUNDATION LOGS, PERPENDICULAR TO THE FLOW AS SHOWN IN PLAN VIEW 2.
- INSTALL BRUSH MATERIAL, INCLUDING BRANCHES, LOGS, AND BRUSH, AND AT LEAST 1" IN DIAMETER. LARGE MATERIALS AND SMALL MATERIALS SHALL BE MIXED, PLACED IN LAYERS NO MORE THAN 1 FOOT DEEP, COVERED IN A THIN LAYER OF ONSITE ALLUVIUM, AND COMPACTED BEFORE PLACING THE NEXT LAYER OF TOE WOOD MATERIAL. CONTINUE PLACING MATERIALS TO FORM A DENSE LAYER OF WOODY MATERIALS AND ONSITE ALLUVIUM TO THE DEPTH AND ELEVATIONS SPECIFIED (PLAN VIEW 3).
- PLACE AN UNCONSOLIDATED LAYER OF SOIL AND COBBLE ON TOP OF BRUSH LAYER.
- COVER SOIL AND COBBLE LAYER IN COIR FIBER MATTING.
- INSTALL LIVE CUTTINGS, INCLUDING BRANCHES AND BRUSH, AT LEAST 5 FEET IN LENGTH, AND AT LEAST 1 INCH IN DIAMETER.
- CONSTRUCT GEOLIFTS OR PLACE TRANSPLANTS (AS SPECIFIED OR DIRECTED BY THE ENGINEER) TO REBUILD THE STREAMBANK ABOVE THE TOE WOOD LAYER.

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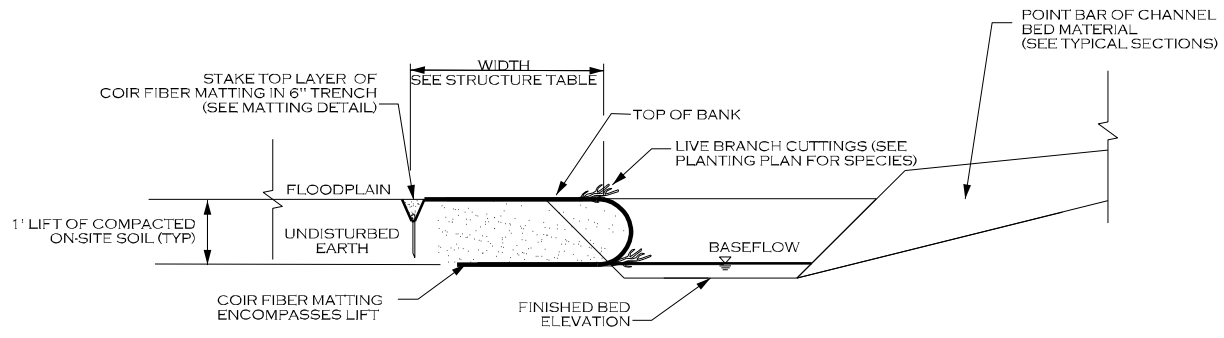
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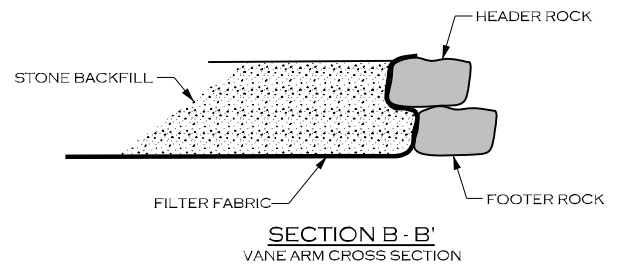
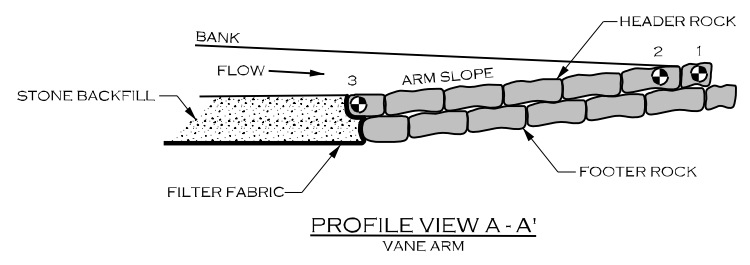
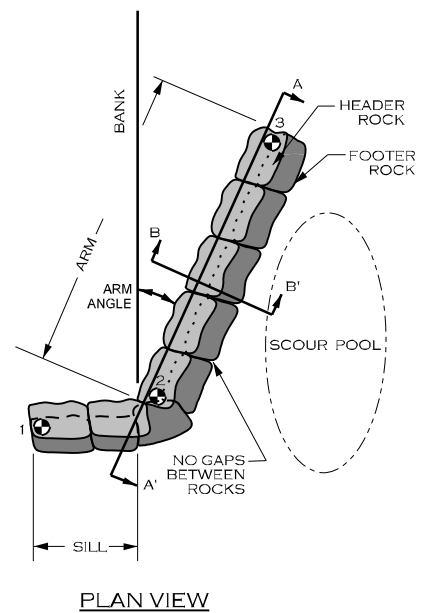
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ROCK VANE (RV)



ROCK VANE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
BOULDER	TYPE: GRANITE OR COMPARABLE SIZE: 3 FT X 2 FT X 2 FT NUMBER OF HEADER ROWS: 1 NUMBER OF FOOTER ROWS: 1
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
<b>NOTES FOR ROCK VANE STRUCTURES:</b>	
1. STRUCTURE DIMENSIONS AND MEASUREMENTS ARE SHOWN ON THE STRUCTURES TABLE SHEET.	
2. DIG A TRENCH BELOW THE STREAM BED FOR FOOTER AND HEADER ROCKS, FILTER FABRIC AND STONE BACKFILL.	
3. PLACE FOOTER ROCKS AND THEN HEADER ROCKS TO ACHIEVE DESIGN DIMENSIONS AND ELEVATIONS.	
4. USE HAND PLACED STONE TO FILL GAPS AND VOIDS ON UPSTREAM SIDE OF THE HEADER AND FOOTER ROCKS.	
5. PLACE FILTER FABRIC BEGINNING AT THE TOP OF THE HEADER ROCKS AND EXTENDING DOWN TO THE DEPTH OF THE FOOTER ROCKS, THEN OUTWARD THE DISTANCE SPECIFIED IN THE STRUCTURES TABLE SHEET.	
6. INSTALL STONE BACKFILL AND ONSITE ALLUVIUM AS SHOWN, TO THE DIMENSIONS INDICATED IN THE STRUCTURES TABLE SHEET.	
7. AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ONSITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.	

⊙ - ELEVATION POINT (SEE STRUCTURES TABLE)

**Permitted Plans**

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1	PERMITTING DESIGN PLANS	EB	KLT	10/25/23

PREPARED FOR:

SC DEPARTMENT OF COMMERCE  
FOR SCOUT MOTORS

SUMTER NATIONAL FOREST  
ENROEE RANGER DISTRICT  
STREAM AND RIPARIAN RESTORATION/  
ENHANCEMENT PROJECT  
MCCLUNEY BRANCH WATERSHED  
CHESTER COUNTY, SOUTH CAROLINA

PREPARED IN THE OFFICE OF:

1150 SE MAYNARD RD, SUITE 140  
CARY, NC 27511  
LICENSE # 5371

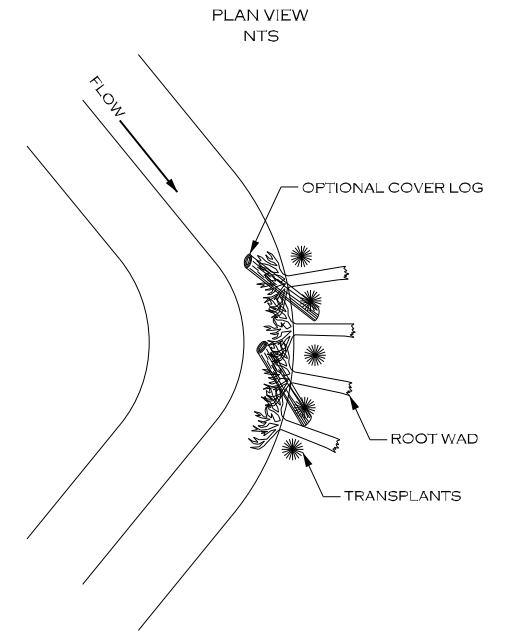
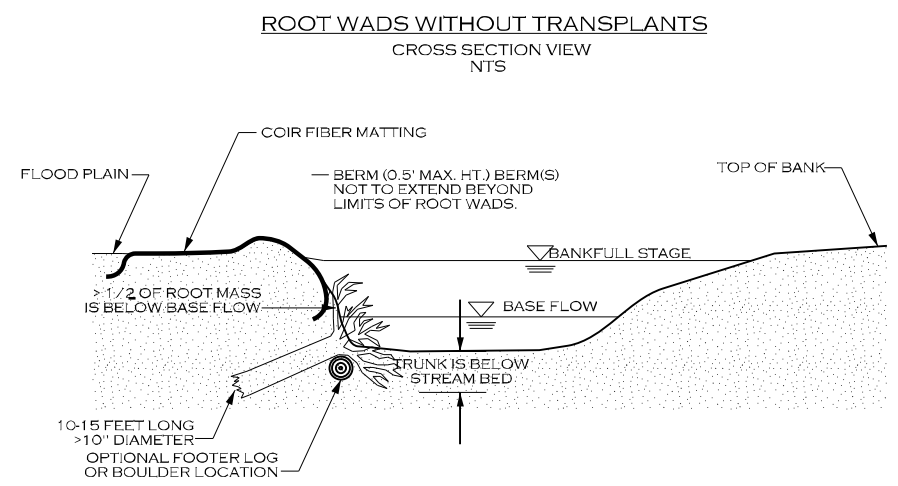
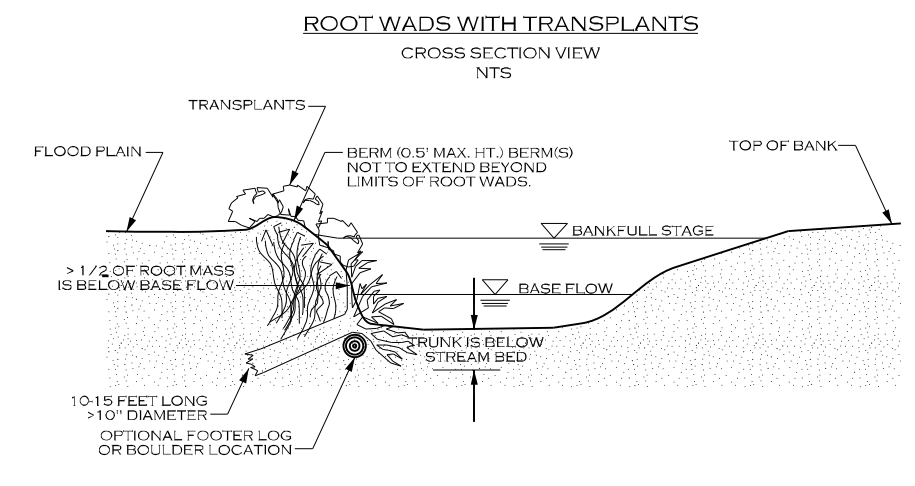
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DETAILS

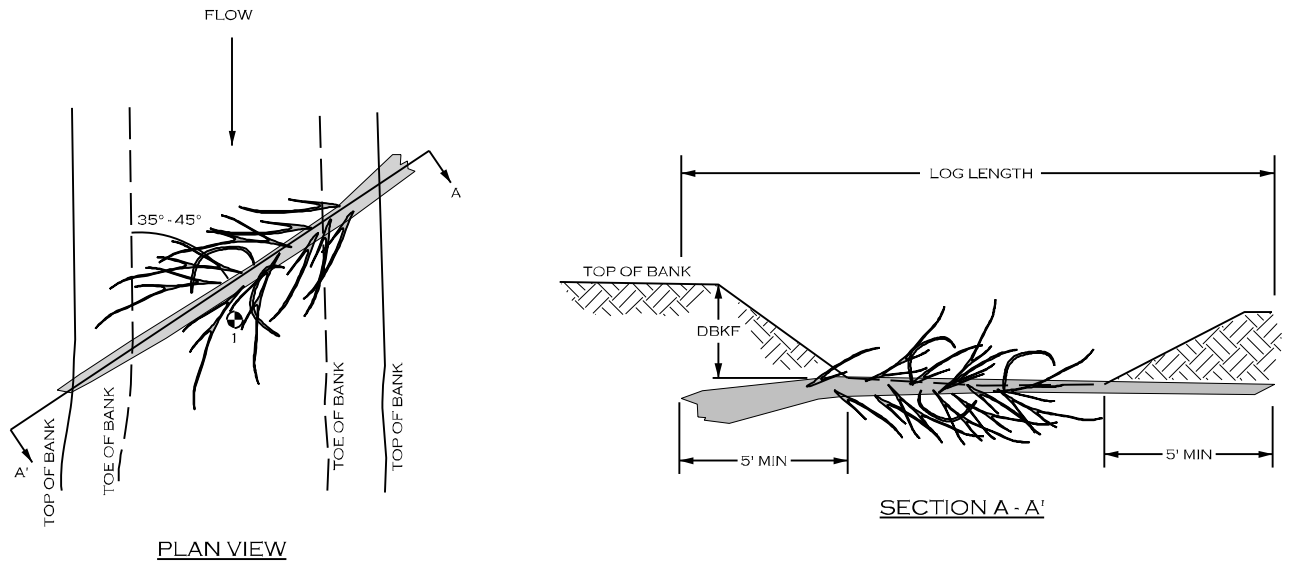
ROOTWAD (RW)



NOTES:  
 TRENCHING METHOD:  
 IF THE ROOT WAD CANNOT BE DRIVEN INTO THE BANK OR THE BANK NEEDS TO BE RECONSTRUCTED, THE TRENCHING METHOD SHOULD BE USED. THIS METHOD REQUIRES THAT A TRENCH BE EXCAVATED FOR THE LOG PORTION OF THE ROOT WAD. IN THIS CASE, A FOOTER LOG SHOULD BE INSTALLED UNDERNEATH THE ROOT WAD IN A TRENCH EXCAVATED PARALLEL TO THE BANK AND WELL BELOW THE STREAMBED. ONE-THIRD OF THE ROOT WAD SHOULD REMAIN BELOW NORMAL BASE FLOW CONDITIONS.

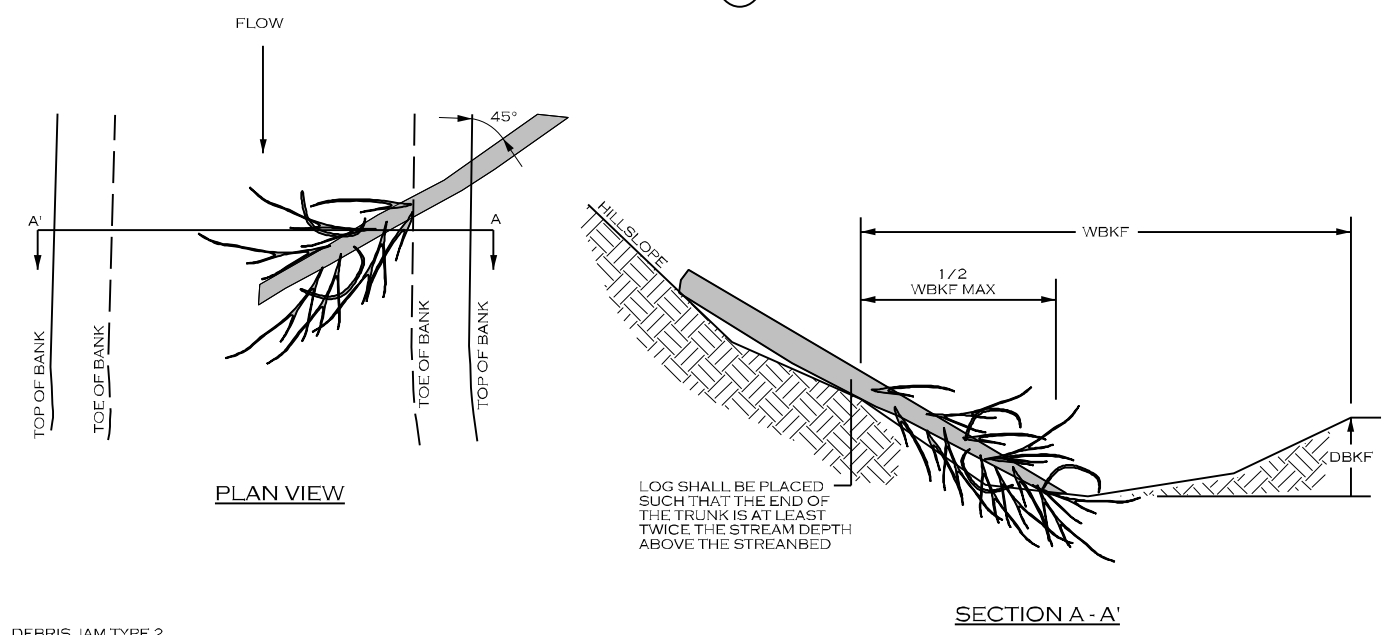
NOTES:  
 DRIVE POINT METHOD:  
 SHARPEN THE END OF THE LOG WITH A CHAINSAW BEFORE "DRIVING" IT INTO THE BANK. ORIENT ROOT WADS AS SHOWN, DEFLECTING THE WATER AWAY FROM THE BANK. A TRANSPLANT SHOULD BE PLACED ON THE DOWNSTREAM SIDE OF THE ROOT WAD IF A BACK EDDY IS FORMED BY THE ROOT WAD.

DEBRIS JAM TYPE 1 (DJ T-1)



- DEBRIS JAM TYPE 1
1. DEBRIS JAM TYPE 1 INSTALLATIONS SHALL BE PLACED WITHIN STREAM RIFFLES TO TRAP DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH FLOWING, AERATED WATER.
  2. TREE SHALL BE ANY NON-EVERGREEN TREE WITH BRANCHES, AT LEAST 8 INCHES DIAMETER, AND NOT ROTTEN.
  3. TREE SHALL HAVE CONSIDERABLE NUMBER OF BRANCHES THAT REMAIN EXPOSED AFTER INSTALLATION AND IN CONTACT WITH THE STREAM FLOW TO TRAP LEAVES AND DETRITUS FROM STREAM FLOW.
  4. TREE SHALL BE INSTALLED SO THAT THE TRUNK IS LEVEL WITH THE BED ELEVATION OF THE STREAM, SUCH THAT THE TRUNK DOES NOT POOL WATER IN FRONT OF THE STRUCTURE. BACKFILL AND COMPACT AROUND THE TRUNK AND INSTALLED TREE TO MINIMIZE VOIDS.

DEBRIS JAM TYPE 2 (DJ T-2)



- DEBRIS JAM TYPE 2
1. DEBRIS JAM TYPE 2 INSTALLATIONS SHALL BE PLACED AREAS WHERE THE STREAM FLOWS AGAINST A STEEP SLOPE. A TREE IS INSTALLED AS SHOWN TO CATCH DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH STREAM FLOWS. THIS DEBRIS JAM MAY BE INSTALLED IN RIFFLE OR POOL LOCATIONS.
  2. TREE SHALL BE ANY NON-EVERGREEN TREE WITH BRANCHES, AT LEAST 8 INCHES DIAMETER, AND NOT ROTTEN.
  3. TREE SHALL HAVE CONSIDERABLE NUMBER OF BRANCHES THAT REMAIN EXPOSED AND IN CONTACT WITH THE STREAM FLOW AFTER INSTALLATION TO TRAP LEAVES AND DETRITUS FROM STREAM FLOW.
  4. TREE SHALL BE INSTALLED SO THAT THE TRUNK LIES UPON THE HILL SLOPE, AND IS ANCHORED TO THE HILLSLOPE TO PREVENT MOVEMENT DURING LARGE STREAM FLOWS. TREE SHALL BE CABLED TO A FRESHLY CUT STUMP OR ANOTHER LIVE TREE OF AT LEAST THE SAME SIZE.

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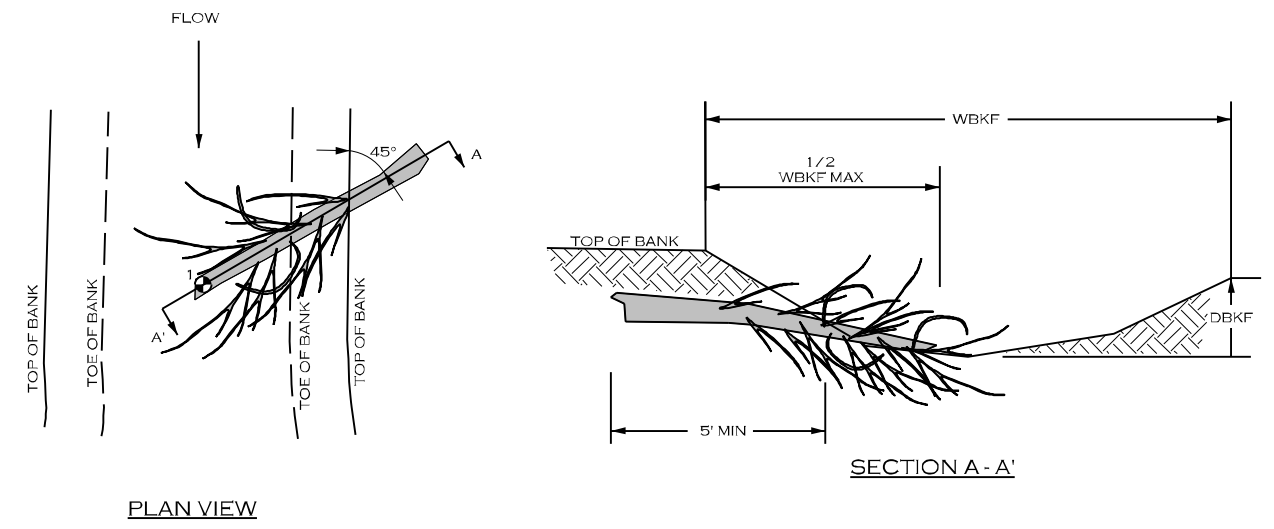
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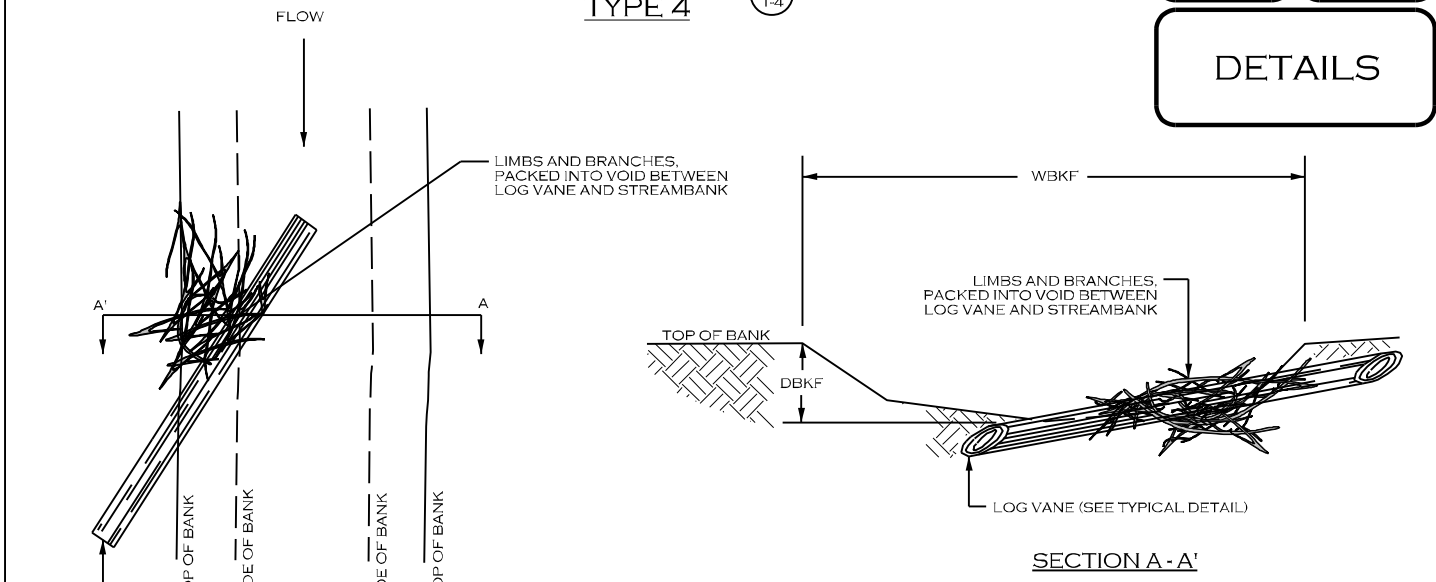
DEBRIS JAM TYPE 3 (DJ T-3)



DEBRIS JAM TYPE 3

1. DEBRIS JAM TYPE 3 INSTALLATIONS SHALL BE PLACED WITHIN STREAM RIFFLES OR POOLS TO TRAP DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH FLOWING WATER.
2. TREE SHALL BE ANY NON-EVERGREEN TREE WITH BRANCHES, AT LEAST 8 INCHES DIAMETER, AND NOT ROTTEN.
3. TREE SHALL HAVE CONSIDERABLE NUMBER OF BRANCHES THAT REMAIN EXPOSED AFTER INSTALLATION AND IN CONTACT WITH THE STREAM FLOW TO TRAP LEAVES AND DETRITUS FROM STREAM FLOW.
4. TREE SHALL BE INSTALLED SO THAT THE TRUNK IS IN CONTACT WITH THE STREAM BED, BACKFILL AND COMPACT AROUND THE TRUNK AND INSTALLED TREE TO MINIMIZE VOIDS.

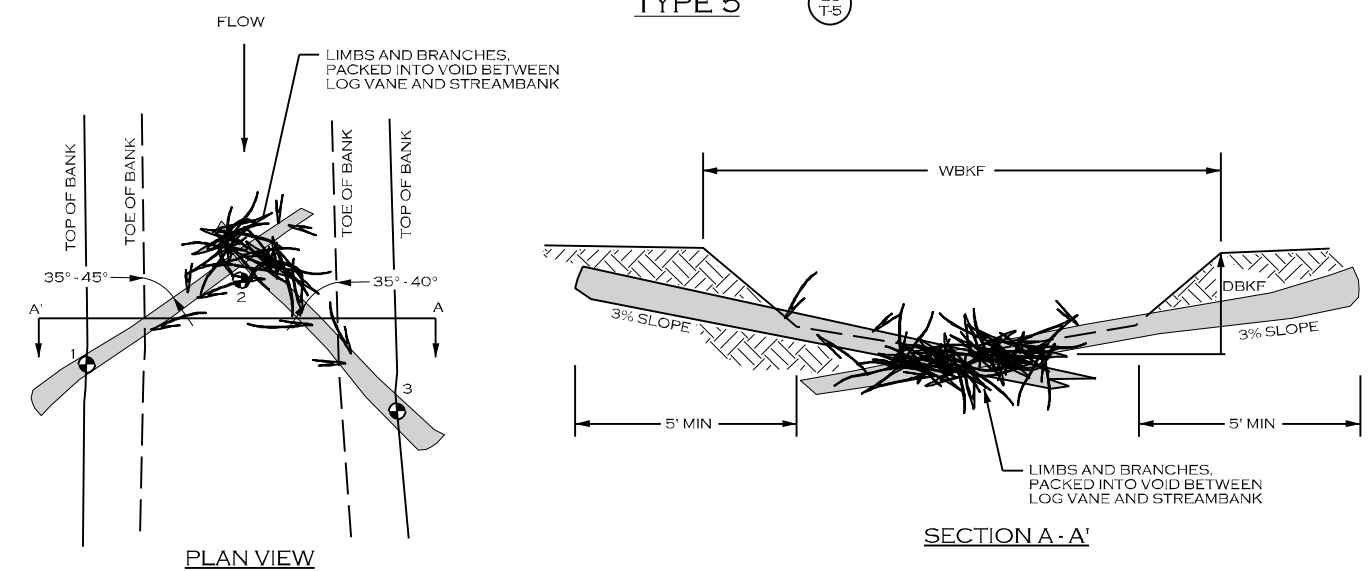
DEBRIS JAM TYPE 4 (DJ T-4)



DEBRIS JAM TYPE 4

1. DEBRIS JAM TYPE 4 INSTALLATIONS SHALL BE INSTALLED IN ASSOCIATION WITH LOG VANE INSTALLATIONS (SEE TYPICAL DETAIL FOR LOG VANE).
2. LIMBS AND BRANCHES THAT FORM THE DEBRIS JAM SHALL VARY IN DIAMETER, BUT SHALL BE AT LEAST 3 FEET LONG WITH MULTIPLE BRANCHES TO PROMOTE ENTANGLING WHEN PACKED TOGETHER. LIMBS AND BRANCHES SHOULD BE A MIXTURE (APPROX. 50/50) OF RECENTLY CUT BRANCHES AND DEAD/DECAYING BRANCHES.
3. PREPARE THE EXCAVATION FOR THE LOG VANE, THEN PLACE THE DEBRIS JAM PRIOR TO PLACING AND INSTALLING THE LOG VANE.
4. WHEN INSTALLED, THE LOG VANE SHOULD PIN THE DEBRIS JAM TO THE STREAM BED AND BANK AND PREVENT EASY MOVEMENT DURING HIGH FLOW EVENTS.
5. AFTER INSTALLATION, STREAM FLOW SHOULD BE IN CONTACT WITH THE DEBRIS JAM, IN ORDER TO TRAP ADDITIONAL DEBRIS AND ORGANIC MATTER.

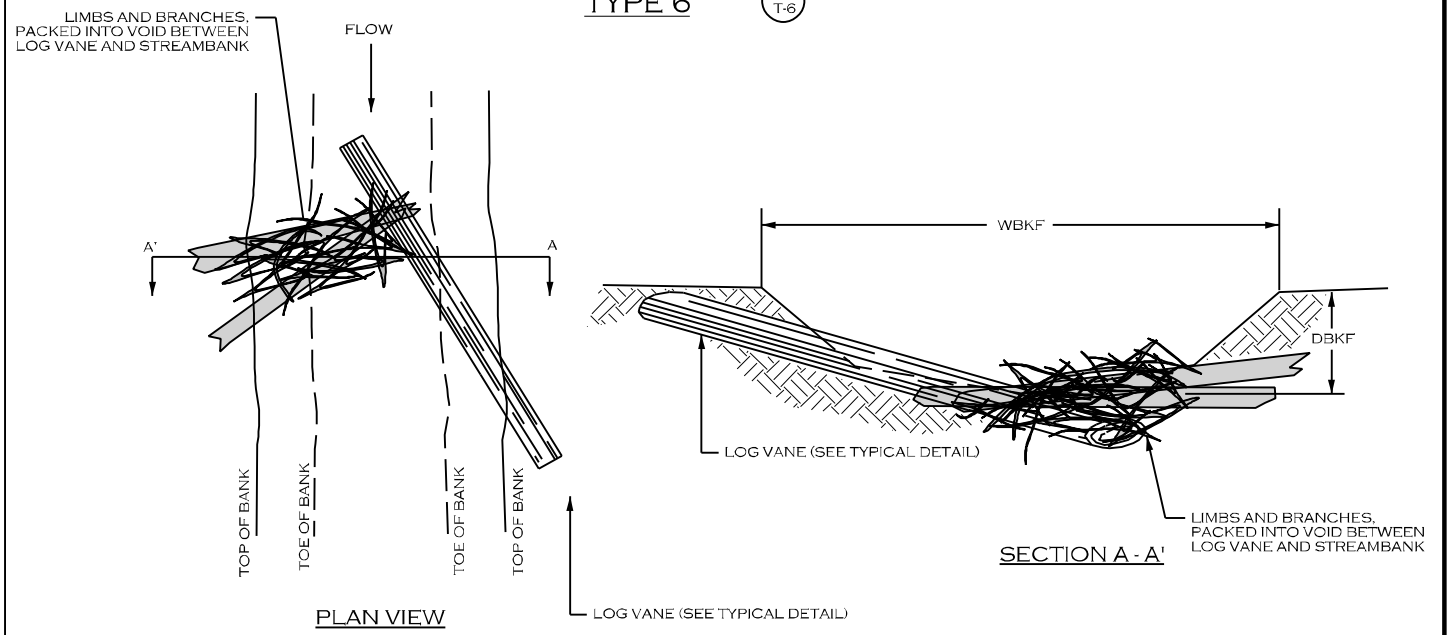
DEBRIS JAM TYPE 5 (DJ T-5)



DEBRIS JAM TYPE 5

1. DEBRIS JAM TYPE 5 INSTALLATIONS SHALL BE PLACED WITHIN STREAM RIFFLES TO TRAP DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH FLOWING, AERATED WATER.
2. LIMBS AND BRANCHES THAT FORM THE DEBRIS JAM SHALL VARY IN DIAMETER, BUT SHALL BE AT LEAST 3 FEET LONG WITH MULTIPLE BRANCHES TO PROMOTE ENTANGLING WHEN PACKED TOGETHER. LIMBS AND BRANCHES SHOULD BE A MIXTURE (APPROX. 50/50) OF RECENTLY CUT BRANCHES AND DEAD/DECAYING BRANCHES.
3. THE INVERT/CENTER OF THE STRUCTURE SHALL BE INSTALLED AT THE STREAM BED ELEVATION, SUCH THAT WATER IS NOT POOLED IN FRONT OF THE STRUCTURE.
4. PREPARE THE EXCAVATION FOR THE TWO LARGER LOGS, THEN PLACE THE DEBRIS JAM PRIOR TO PLACING AND INSTALLING THE TWO LARGER LOGS.
5. WHEN INSTALLED, THE LARGER LOGS SHOULD PIN THE DEBRIS JAM TO THE STREAM BED AND PREVENT EASY MOVEMENT DURING HIGH FLOW EVENTS. SMALL BOULDERS CAN BE USED TO PIN THE LARGER LOGS IN POSITION TO PREVENT MOVEMENT DURING STORM FLOWS.
6. AFTER INSTALLATION, STREAM FLOW SHOULD BE IN CONTACT WITH THE DEBRIS JAM, IN ORDER TO TRAP ADDITIONAL DEBRIS AND ORGANIC MATTER.

DEBRIS JAM TYPE 6 (DJ T-6)



DEBRIS JAM TYPE 6

1. DEBRIS JAM TYPE 6 INSTALLATIONS SHALL BE PLACED IN ASSOCIATION WITH LOG VANES TO TRAP DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH FLOWING, AERATED WATER.
2. LIMBS AND BRANCHES THAT FORM THE DEBRIS JAM SHALL VARY IN DIAMETER, BUT SHALL BE AT LEAST 3 FEET LONG WITH MULTIPLE BRANCHES TO PROMOTE ENTANGLING WHEN PACKED TOGETHER. SMALL LOGS INCORPORATED INTO THE DEBRIS JAM SHALL BE LONG ENOUGH TO BE PINNED INTO PLACE BY THE LOG VANE AND BURIED INTO THE ADJACENT BANK. LIMBS, BRANCHES, AND SMALL LOGS SHOULD BE A MIXTURE (APPROX. 50/50) OF RECENTLY CUT BRANCHES AND DEAD/DECAYING BRANCHES.
3. THE INVERT/CENTER OF THE STRUCTURE SHALL BE INSTALLED AT THE STREAM BED ELEVATION, SUCH THAT WATER IS NOT POOLED IN FRONT OF THE STRUCTURE. AFTER COMPLETION, MOST STREAM FLOW SHOULD FLOW OVER THE LOG VANE AND BE CENTERED NEAR THE MIDDLE OF THE CHANNEL.

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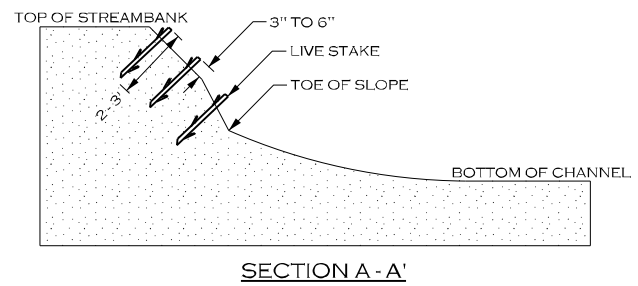
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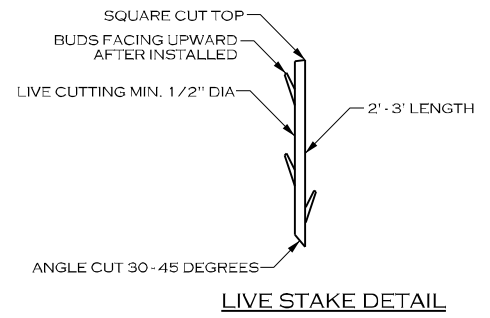
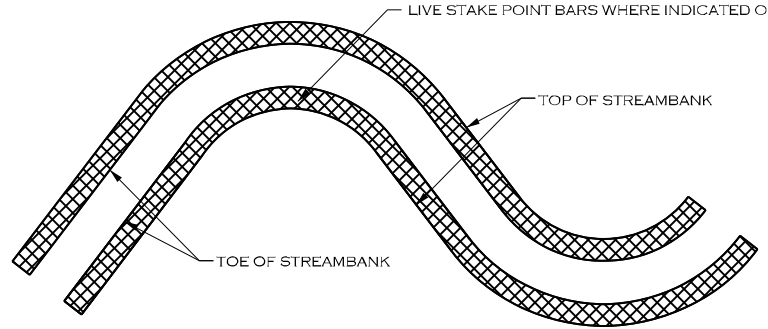
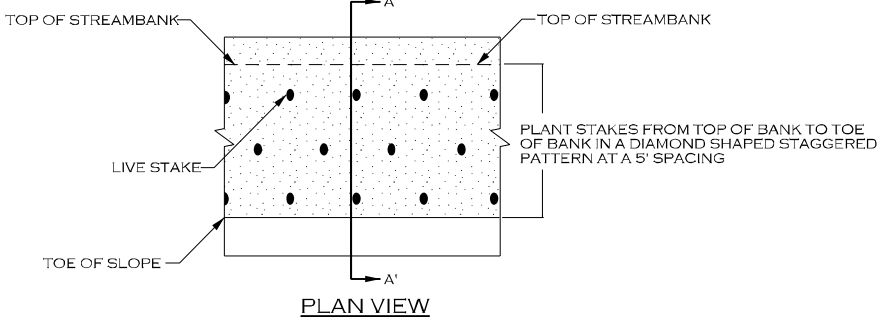
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**LIVE STAKING**

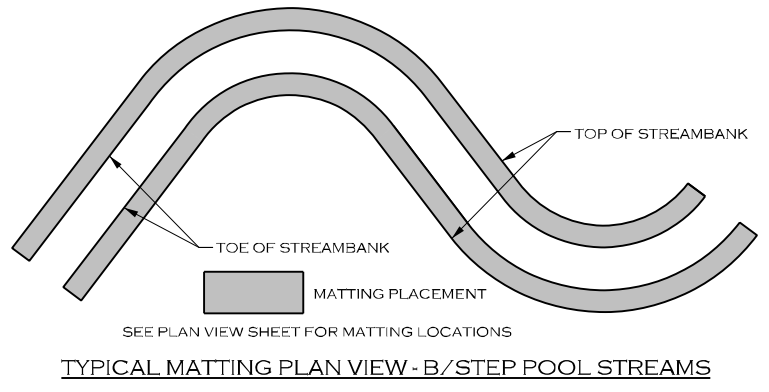
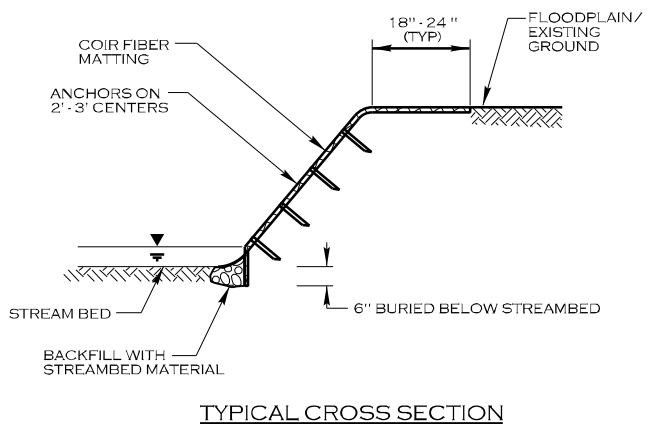
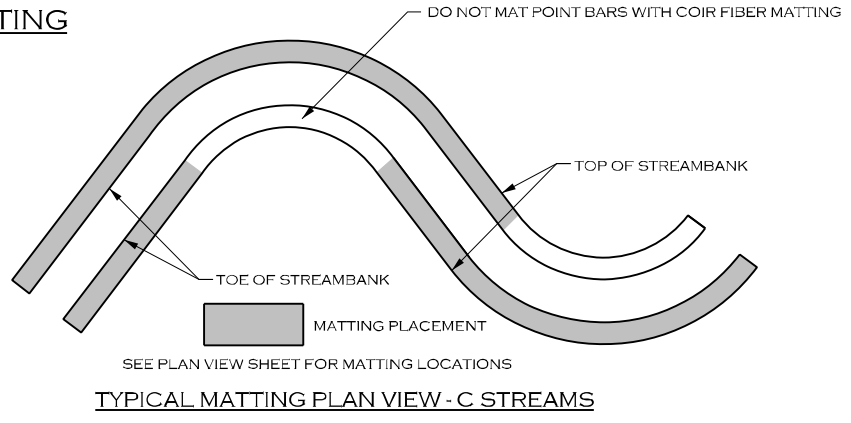
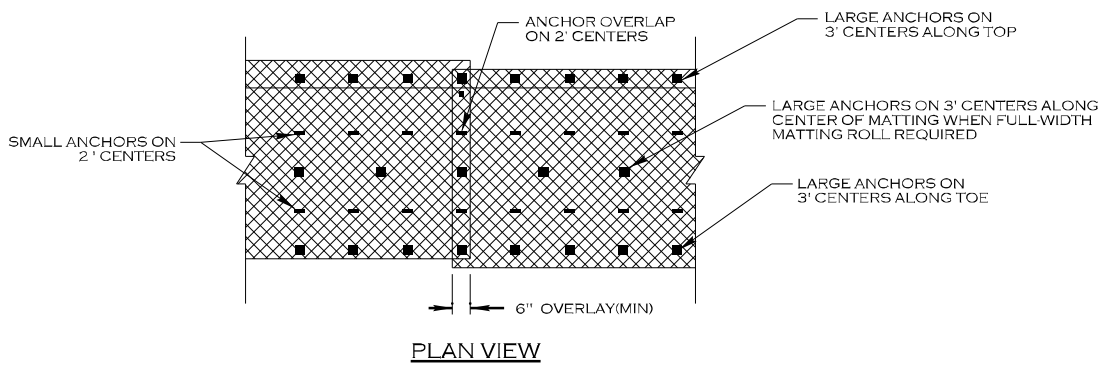


**NOTES:**

1. IF STAKES ARE BEING HARVESTED NEAR THE SITE, STAKES SHOULD BE CUT AND INSTALLED ON THE SAME DAY.
2. KEEP STAKES COOL AND MOIST WHILE ON THE JOB SITE AND PRIOR TO INSTALLATION.
3. DO NOT INSTALL STAKES THAT HAVE BEEN SPLIT.
4. STAKES MUST BE INSTALLED WITH BUDS POINTING UPWARDS.
5. STAKES SHALL BE INSTALLED PERPENDICULAR TO BANK.
6. STAKES SHALL BE 1/2 TO 2 INCHES IN DIAMETER AND 2 TO 3 FT LONG.
7. STAKES SHALL BE INSTALLED LEAVING 1/5 OF STAKE ABOVE GROUND.

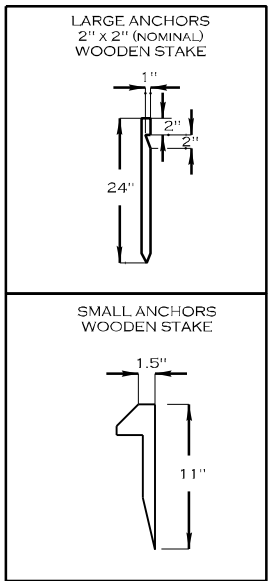
SEE PLAN VIEW SHEET FOR LIVE STAKING LOCATIONS  
**TYPICAL LIVE STAKING AREA PLAN VIEW**

**COIR FIBER MATTING**



**NOTES:**

1. IN AREAS TO BE MATTED, ALL SEEDING, SOIL AMENDMENTS, AND SOIL PREPARATION MUST BE COMPLETED PRIOR TO PLACEMENT OF COIR FIBER MATTING.
2. WOODEN STAKES ARE PREFERRED. USE OF STAPLES AS SMALL ANCHORS MUST BE PRE-APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.



**ANCHOR OPTIONS**

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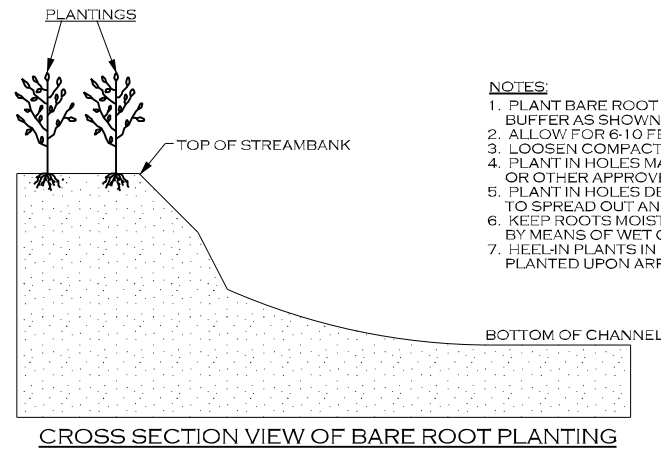
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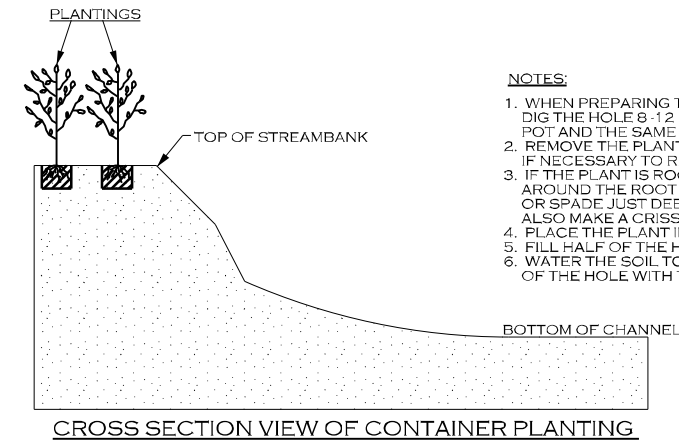
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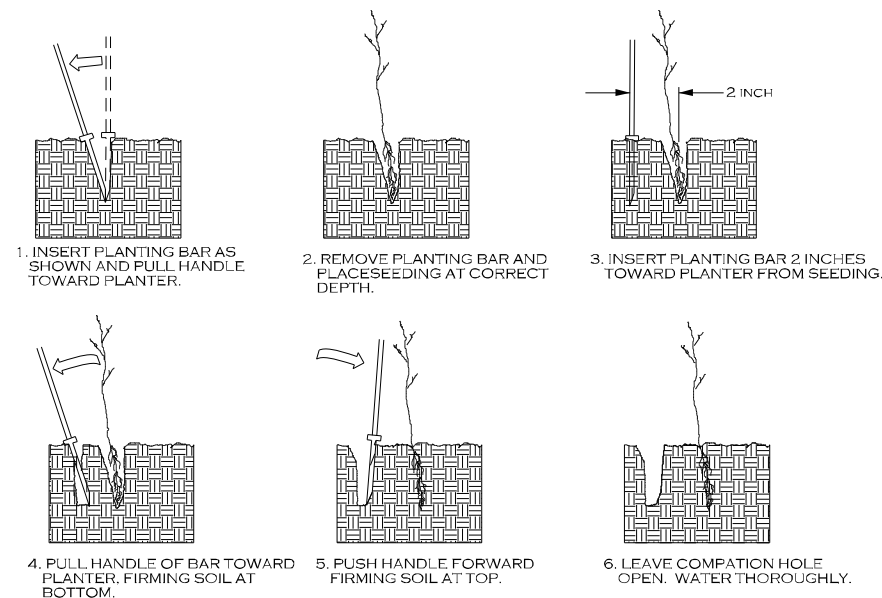
- NOTES:**
1. PLANT BARE ROOT SHRUBS AND TREES TO THE WIDTH OF THE BUFFER AS SHOWN ON THE PLANS.
  2. ALLOW FOR 6-10 FEET BETWEEN PLANTINGS, DEPENDING ON SIZE.
  3. LOOSEN COMPACTED SOIL.
  4. PLANT IN HOLES MADE BY A MATTOCK, DIBBLE, PLANTING BAR, OR OTHER APPROVED MEANS.
  5. PLANT IN HOLES DEEP AND WIDE ENOUGH TO ALLOW THE ROOTS TO SPREAD OUT AND DOWN WITHOUT J-ROOTING.
  6. KEEP ROOTS MOIST WHILE DISTRIBUTING OR WAITING TO PLANT BY MEANS OF WET CANVAS, BURLAP, OR STRAW.
  7. HEEL-IN PLANTS IN MOIST SOIL OR SAWDUST IF NOT PROMPTLY PLANTED UPON ARRIVAL TO PROJECT SITE.



- NOTES:**
1. WHEN PREPARING THE HOLE FOR A POTTED PLANT OR SHRUB DIG THE HOLE 8-12 INCHES LARGER THAN THE DIAMETER OF THE POT AND THE SAME DEPTH AS THE POT.
  2. REMOVE THE PLANT FROM THE POT. LAY THE PLANT ON ITS SIDE IF NECESSARY TO REMOVE THE POT.
  3. IF THE PLANT IS ROOTBOUND (ROOTS GROWING IN A SPIRAL AROUND THE ROOT BALL), MAKE VERTICAL CUTS WITH A KNIFE OR SPADE JUST DEEP ENOUGH TO CUT THE NET OF ROOTS. ALSO MAKE A CRISS-CROSS CUT ACROSS THE BOTTOM OF THE BALL.
  4. PLACE THE PLANT IN THE HOLE.
  5. FILL HALF OF THE HOLE WITH SOIL (SAME SOIL REMOVED FOR BACKFILL).
  6. WATER THE SOIL TO REMOVE AIR POCKETS AND FILL THE REST OF THE HOLE WITH THE REMAINING SOIL.

**Permitted Plans**

**DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR**



**PLANTING NOTES:**

**PLANTING BAG**

DURING PLANTING, SEEDLINGS SHALL BE KEPT IN A MOIST CANVAS BAG OR SIMILAR CONTAINER TO PREVENT THE ROOT SYSTEMS FROM DRYING.

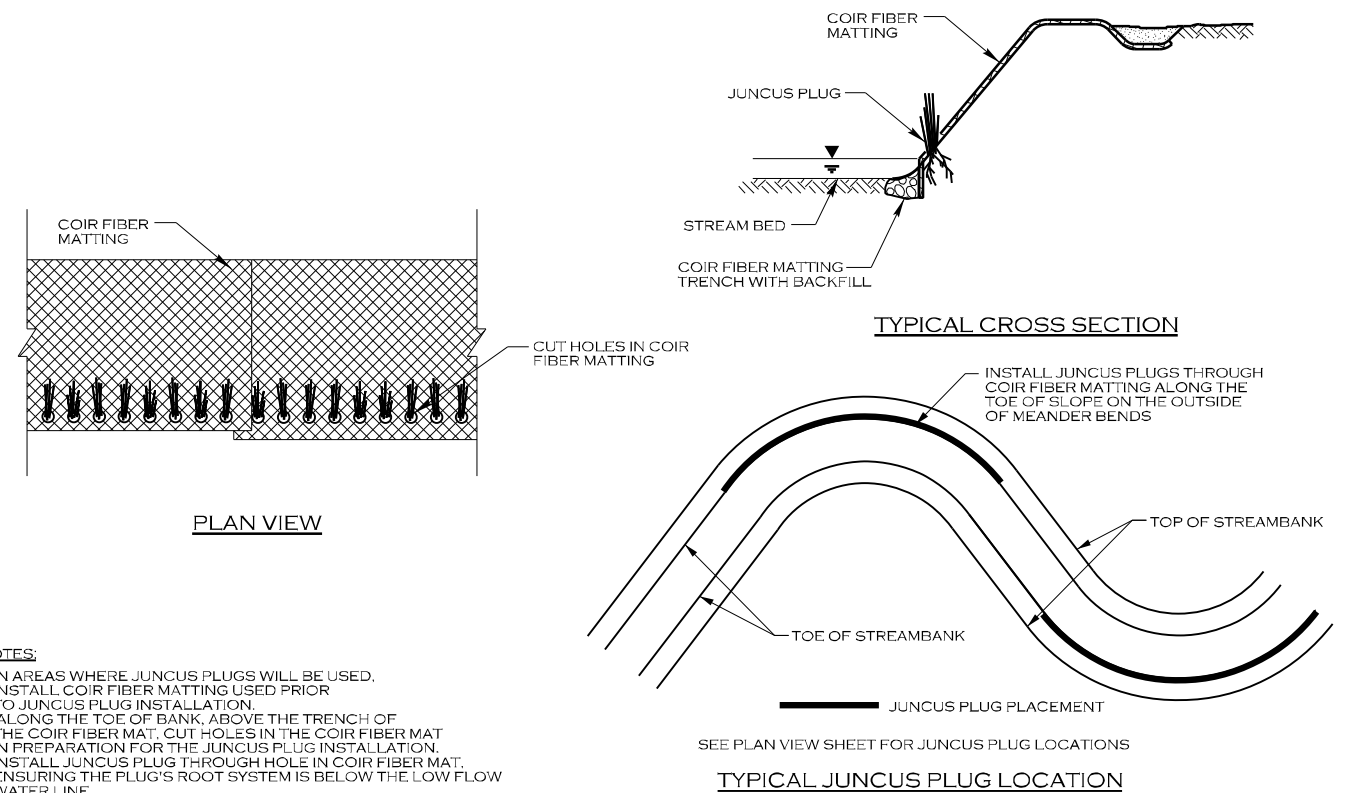
**KBC PLANTING BAR**

PLANTING BAR SHALL HAVE A BLADE WITH A TRIANGULAR CROSS SECTION, AND SHALL BE 12 INCHES LONG, 4 INCHES WIDE AND 1 INCH THICK AT CENTER.

**ROOT PRUNING**

ALL SEEDLINGS SHALL BE ROOT PRUNED, IF NECESSARY, SO THAT NO ROOTS EXTEND MORE THAN 10 INCHES BELOW THE ROOT COLLAR.

**JUNCUS PLUG**



**NOTES:**

1. IN AREAS WHERE JUNCUS PLUGS WILL BE USED, INSTALL COIR FIBER MATTING USED PRIOR TO JUNCUS PLUG INSTALLATION.
2. ALONG THE TOE OF BANK, ABOVE THE TRENCH OF THE COIR FIBER MAT, CUT HOLES IN THE COIR FIBER MAT IN PREPARATION FOR THE JUNCUS PLUG INSTALLATION.
3. INSTALL JUNCUS PLUG THROUGH HOLE IN COIR FIBER MAT, ENSURING THE PLUG'S ROOT SYSTEM IS BELOW THE LOW FLOW WATER LINE.

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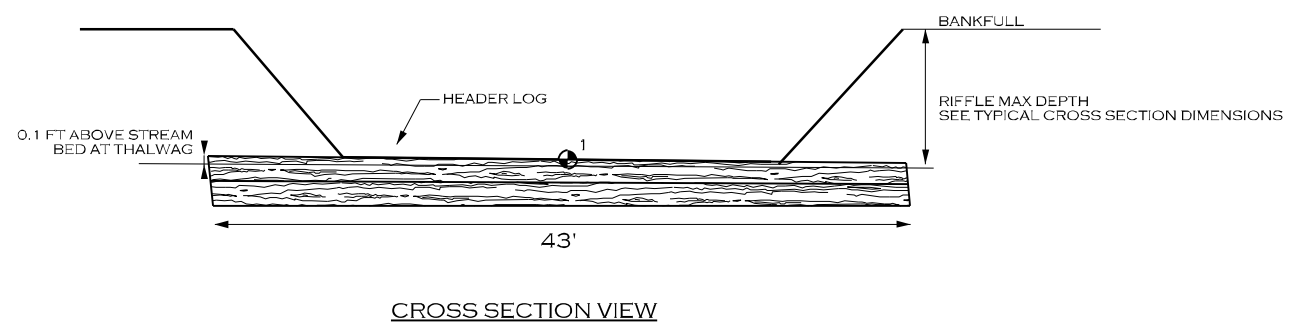
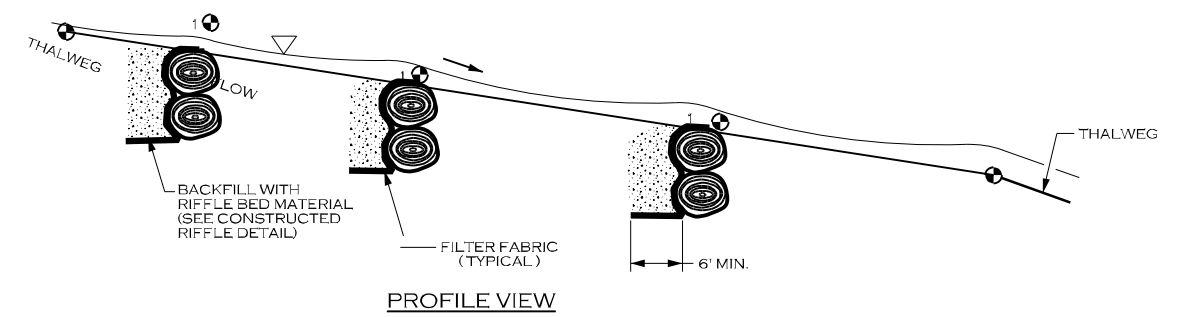
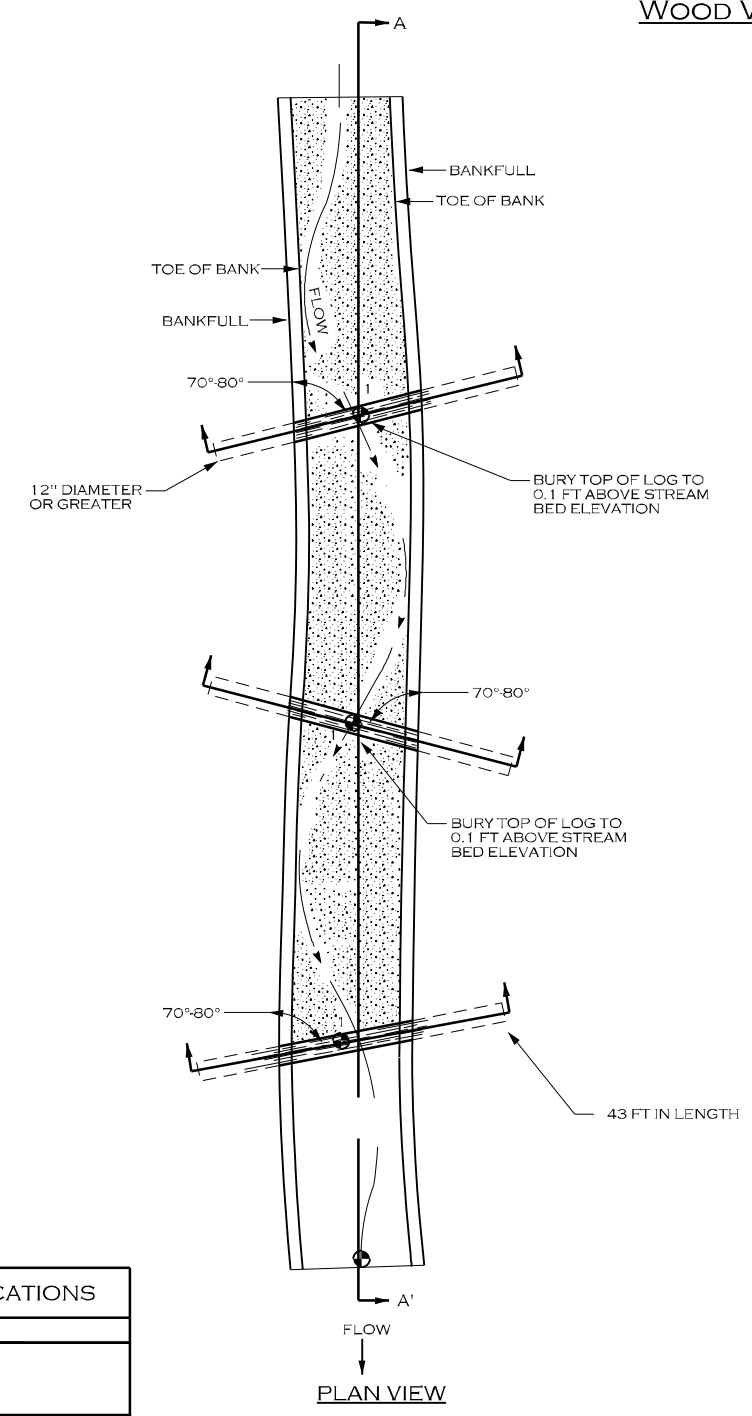
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DETAILS



WOOD VALLEY GRADE CONTROL SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
RIFFLE BED MATERIAL	SEE CONSTRUCTED RIFFLE DETAIL
LOGS	TYPE: HARDWOOD SIZE: LENGTH = 43 FEET, 12" DIA. NUMBER OF HEADER LOGS: 1 NUMBER OF FOOTER LOGS: 1
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
<b>NOTES FOR LOG ROLLER STRUCTURES:</b>	
1. STRUCTURE DIMENSIONS AND MEASUREMENTS ARE SHOWN ON THE STRUCTURE TABLES SHEET. NUMBER OF LOGS MAY VARY.	
2. LOGS SHOULD BE STRAIGHT, HARDWOOD, AND NOT ROTTEN.	
3. SOIL SHOULD BE COMPACTED WELL AROUND BURIED PORTIONS OF LOGS.	
4. FILTER FABRIC SHOULD BE NAILED TO THE LOG BELOW THE STONE BACKFILL.	
5. RIFFLE STATIONS AND ELEVATIONS (1 & 5) ARE SHOWN ON BOTH THE STRUCTURE TABLES FOR WOOD VALLEY GRADE CONTROL AND CONSTRUCTED RIFFLES IF APPLICABLE.	
6. NUMBER OF LOGS MAY VARY.	


● ELEVATION POINT (SEE STRUCTURE TABLES)

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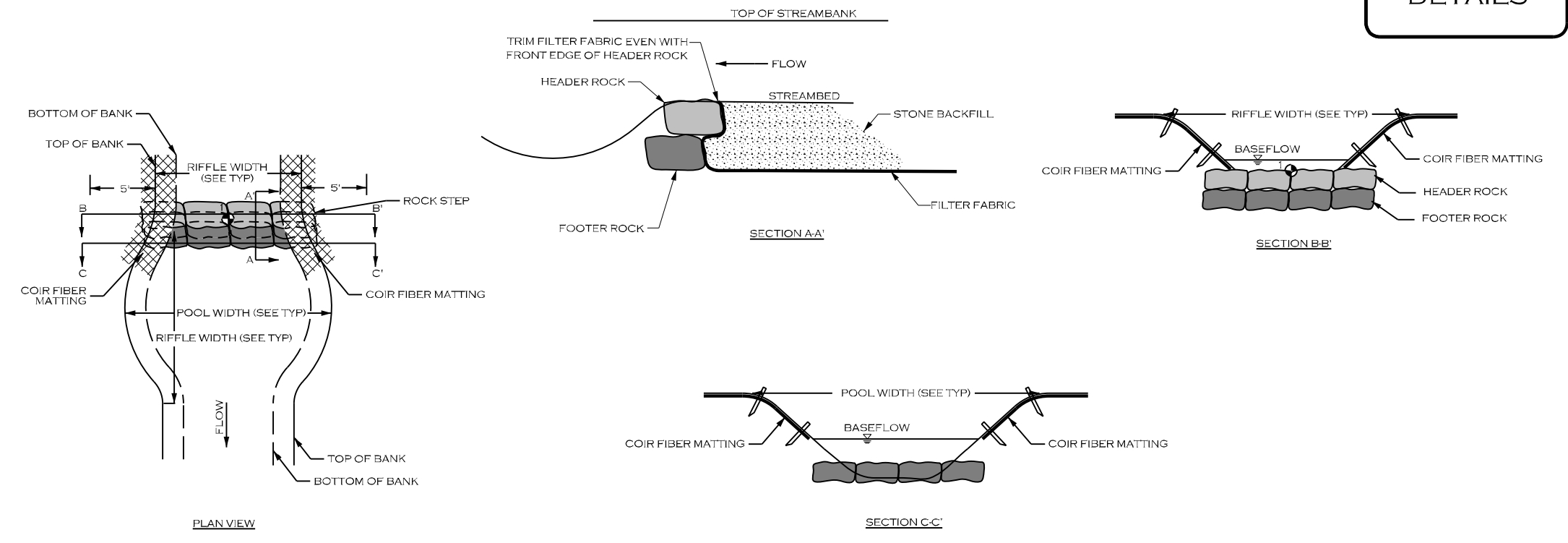


DETAILS

ROCK STEP (RS)

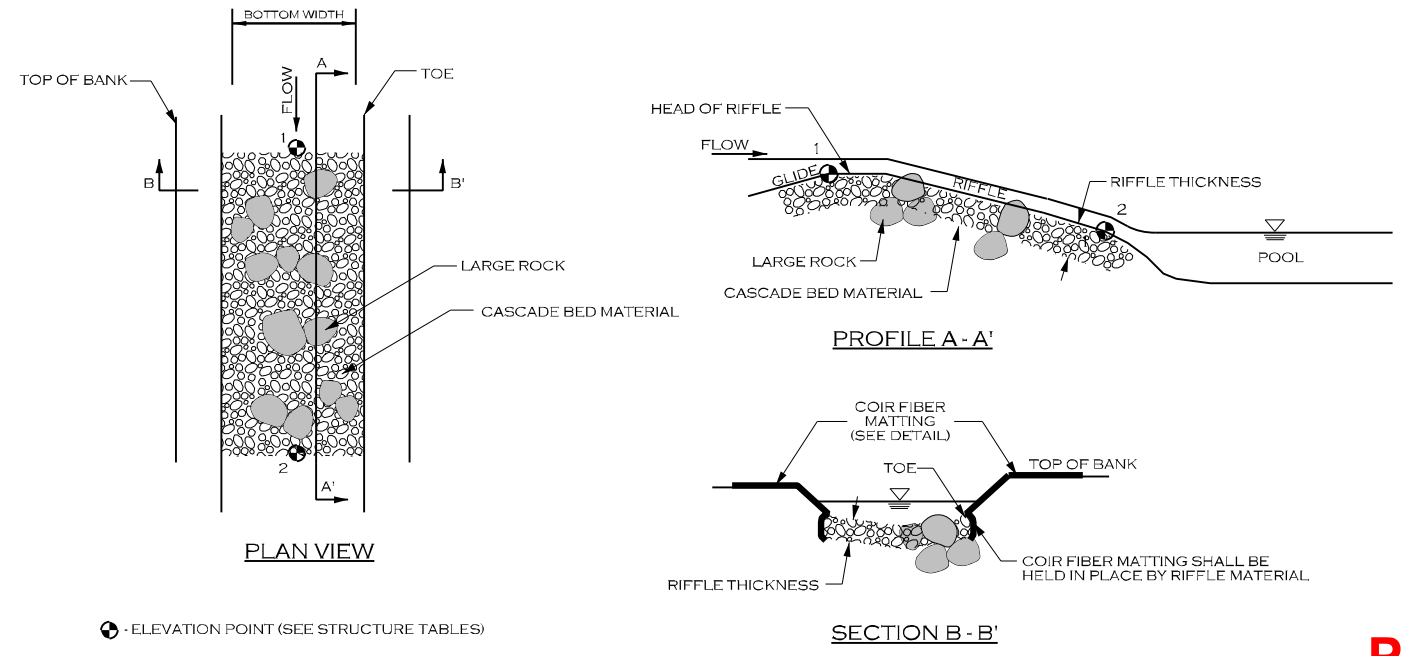
• ELEVATION POINT (SEE STRUCTURE TABLE)

ROCK STEP SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
BOULDER	TYPE: GRANITE OR COMPARABLE SIZE: 3 FT X 2 FT X 2 FT
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
COIR FIBER MATTING	TYPE: SEE DETAIL
<b>NOTES FOR ROCK STEP STRUCTURES:</b>	
<ol style="list-style-type: none"> <li>DIG A TRENCH BELOW THE STREAM BED FOR FOOTER AND HEADER ROCKS, FILTER FABRIC AND STONE BACKFILL.</li> <li>PLACE FOOTER ROCKS AND THEN HEADER ROCKS TO ACHIEVE DESIGN DIMENSIONS AND ELEVATIONS.</li> <li>USE HAND PLACED STONE TO FILL GAPS AND VOIDS ON UPSTREAM SIDE OF THE HEADER AND FOOTER ROCKS.</li> <li>PLACE FILTER FABRIC BEGINNING AT THE TOP OF THE HEADER ROCKS AND EXTENDING DOWN TO THE DEPTH OF THE FOOTER ROCKS, THEN OUTWARD THE DISTANCE SPECIFIED IN THE STRUCTURES TABLE SHEET.</li> <li>INSTALL STONE BACKFILL, AS SHOWN, TO THE DIMENSIONS INDICATED IN THE STRUCTURES TABLE SHEET.</li> <li>AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ONSITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.</li> <li>PLACE TRANSPLANTS FROM TOE OF STREAMBANK TO TOP OF STREAMBANK.</li> <li>TRANSPLANTS CAN BE SUBSTITUTED WITH COIR FIBER MATTING AT THE DIRECTION OF THE ENGINEER.</li> </ol>	



CONSTRUCTED CASCADE (CC)

CONSTRUCTED CASCADE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
LARGE ROCKS	TYPE: GRANITE OR COMPARABLE SIZE: 2 X 1 X 1 FT THICKNESS: 24 INCHES MIN.
CASCADE BED MATERIAL	TYPE: GRANITE OR COMPARABLE SIZE: CLASS A AND CLASS B (50/50 MIX) THICKNESS: 16 INCHES MIN.
COIR FIBER MATTING	SEE DETAIL
<b>NOTES FOR CONSTRUCTED CASCADE STRUCTURES:</b>	
<ol style="list-style-type: none"> <li>GRADE STREAMBED AND BANKS TO PROPOSED DIMENSIONS PER TYPICAL CROSS-SECTION AND PROFILE.</li> <li>EXCAVATE TRENCH BELOW PROPOSED STREAMBED ELEVATION EQUAL TO OR GREATER THAN RIFFLE THICKNESS.</li> <li>PLACE COIR FIBER MATTING ON BANKS AND LAY DOWN INTO TRENCH EXCAVATED FOR RIFFLE BED MATERIAL.</li> <li>FILL TRENCH WITH STONE TO FINAL DESIGN STREAM GRADE.</li> </ol>	



• ELEVATION POINT (SEE STRUCTURE TABLES)

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FOR SCOUT MOTORS

SUMTER NATIONAL FOREST  
ENROEE RANGER DISTRICT  
STREAM AND RIPARIAN RESTORATION/  
ENHANCEMENT PROJECT  
McCLUNEY BRANCH WATERSHED  
CHESTER COUNTY, SOUTH CAROLINA

PREPARED IN THE OFFICE OF:

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CARY, NC 27511  
LICENSE # 5371

PROJECT ENGINEER

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# VEGETATION SELECTION

## TABLES

### SOUTH-CENTRAL OAK-HARDWOOD & PINE FOREST

PIGNET HICKORY (*CARYA GLABRA*)  
 MOCKERNUT HICKORY (*CARYA TOMENTOSA*)  
 FLOWERING DOGWOOD (*CORNUS FLORIDA*)  
 EASTERN RED CEDAR (*JUNIPERUS VIRGINIANA*)  
 TULIP POPLAR (*LIRIODENDRON TULIPIFERA*)  
 BLACK GUM (*NYSSA SYLVATICA*)

SOURWOOD (*OXYDENDRUM ARBOREUM*)  
 SHORTLEAF PINE (*PINUS ECHINATA*)  
 SOUTHERN RED OAK (*QUERCUS FALCATA*)  
 NORTHERN RED OAK (*QUERCUS RUBRA*)  
 POST OAK (*QUERCUS STELLATA*)  
 BLACK OAK (*QUERCUS VELUTINA*)

### CENTRAL MESOPHYTIC HARDWOOD FOREST

SOUTHERN SUGAR MAPLE (*ACER BARBATUM*)  
 RED MAPLE (*ACER RUBRUM*)  
 SOUTHERN SHAGBARK HICKORY  
 (*CARYA CAROLINAE-SEPTRIONALIS*)  
 PIGNET HICKORY (*CARYA GLABRA*)  
 MOCKERNUT HICKORY (*CARYA TOMENTOSA*)  
 SUGARBERRY (*CELTIS LAEVIGATA*)  
 AMERICAN BEECH (*FAGUS GRANDIFOLIA*)  
 WHITE ASH (*FRAXINUS AMERICANA*)  
 BLACK WALNUT (*JUGLANS NIGRA*)  
 TULIP POPLAR (*LIRIODENDRON TULIPIFERA*)

CUCUMBER MAGNOLIA (*MAGNOLIA ACUMINATA*)  
 BLACK GUM (*NYSSA SYLVATICA*)  
 WHITE OAK (*QUERCUS ALBA*)  
 BLACK OAK (*QUERCUS NIGRA*)  
 NORTHERN RED OAK (*QUERCUS RUBRA*)  
 AMERICAN BASSWOOD (*TILIA AMERICANA*)  
 IRONWOOD (*CARPINUS CAROLINIANA*)  
 REDBUD (*CERCIS CANADENSIS*)  
 FLOWERING DOGWOOD (*CORNUS FLORIDA*)  
 HOP HORNBEAM (*OSTRYA VIRGINIANA*)  
 SOURWOOD (*OXYDENDRUM ARBOREUM*)

### SOUTHERN FLOODPLAIN HARDWOOD FOREST

SOUTHERN SUGAR MAPLE (*ACER BARBATUM*)  
 BOXELDER (*ACER NEGUNDO*)  
 RED MAPLE (*ACER RUBRUM*)  
 RIVER BIRCH (*BETULA NIGRA*)  
 SHAGBARK HICKORY (*CARYA OVATA*)  
 SUGARBERRY (*CELTIS LAEVIGATA*)  
 AMERICAN BEECH (*FAGUS GRANDIFOLIA*)  
 BLACK WALNUT (*JUGLANS NIGRA*)  
 TULIP POPLAR (*LIRIODENDRON TULIPIFERA*)  
 BLACK GUM (*NYSSA SYLVATICA*)  
 AMERICAN SYCAMORE (*PLATANUS OCCIDENTALIS*)  
 WHITE OAK (*QUERCUS ALBA*)  
 SWAMP CHESTNUT OAK (*QUERCUS MICHAUXII*)

WILLOW OAK (*QUERCUS PHELLOS*)  
 NORTHERN RED OAK (*QUERCUS RUBRA*)  
 AMERICAN BASSWOOD (*TILIA AMERICANA*)  
 AMERICAN ELM (*ULMUS AMERICANA*)  
 SWITCH CANE (*ARUNDINARIA TECTA*)  
 BEAUTYBERRY (*CALLICARPA AMERICANA*)  
 IRONWOOD (*CARPINUS CAROLINIANA*)  
 FLOWERING DOGWOOD (*CORNUS FLORIDA*)  
 POSSUMHAW (*ILEX DECIDUA*)  
 EASTERN RED CEDAR (*JUNIPERUS VIRGINIANA*)  
 SPICEBUSH (*LINDERA BENZOIN*)  
 SOURWOOD (*OXYDENDRUM ARBOREUM*)

### EASTERN NORTH AMERICA WET MEADOW AND MARSH

SILKY DOGWOOD (*CORNUS AMOMUM*)  
 BLACK WILLOW (*SALIX NIGRA*)

BUTTONBUSH (*CEPHALANTHUS OCCIDENTALIS*)

### NORTHERN & CENTRAL SWAMP FOREST (STREAMSIDE ASSEMBLAGE)

RED MAPLE (*ACER RUBRUM*)  
 BLACK GUM (*NYSSA SYLVATICA*)  
 WILLOW OAK (*QUERCUS PHELLOS*)  
 TAG ALDER (*ALNUS SERRULATA*)

IRONWOOD (*CARPINUS CAROLINIANA*)  
 SILKY DOGWOOD (*CORNUS AMOMUM*)  
 POSSUMHAW (*ILEX DECIDUA*)  
 ELDERBERRY (*SAMBUCUS CANADENSIS*)

### NOTES:


1. SPECIES LISTED ARE PRELIMINARY AND MAY BE MODIFIED BASED ON AVAILABILITY AT THE TIME OF PLANTING.
2. SPECIES TO BE PLANTED WILL BE CLOSELY COORDINATED WITH THE US FOREST SERVICE STAFF AT SUMTER NATIONAL FOREST, ENOREE RANGE DISTRICT.
3. CLEARING AND REMOVAL OF EXISTING TREES AND VEGETATION WILL BE LIMITED TO THE EXTENT PRACTICABLE.
4. ALL DISTURBED AREAS WILL BE REPLANTED WITH APPROPRIATE HERBACEOUS AND WOODY SPECIES, BASED ON LANDSCAPE POSITION, MOISTURE REGIME, LANDFORM, AND SOILS.
5. THE NORTHERN AND CENTRAL SWAMP FOREST (STREAMSIDE ASSEMBLAGE) CORRESPONDS TO VEGETATED WETLANDS IN SEEPAGES AND SMALL STREAM HEADWATERS.
6. THE SOUTHERN FLOODPLAIN HARDWOOD FOREST IS THE PRIMARY TARGET COMMUNITY FOR FLOODPLAIN AREAS.
7. THE EASTERN NORTH AMERICAN WET MEADOW AND MARSH AREAS CORRESPOND TO LOW LYING AND DEPRESSIONAL (FLOODPLAIN POOL) AREAS.
8. THE CENTRAL MESOPHYTIC HARDWOOD FOREST SPECIES WILL BE PLANTED ALONG TERRACE AND VALLEY SIDE SLOPES.
9. THE SOUTH-CENTRAL OAK-HARDWOOD AND PINE FOREST WILL BE REPLANTED ON ADJACENT UPLAND AND ACCESS AREAS WITHIN THE LIMITS OF DISTURBANCE.

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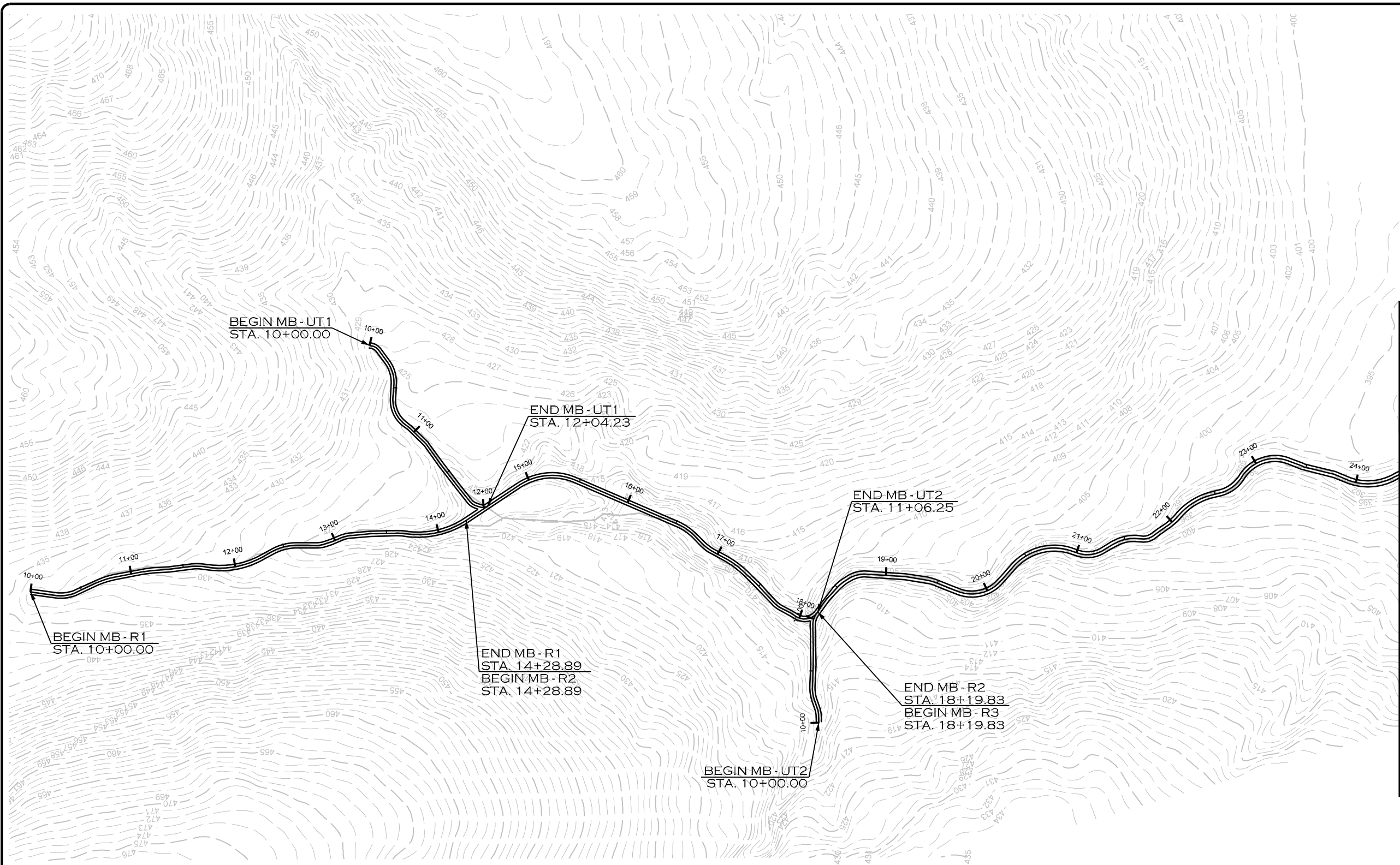


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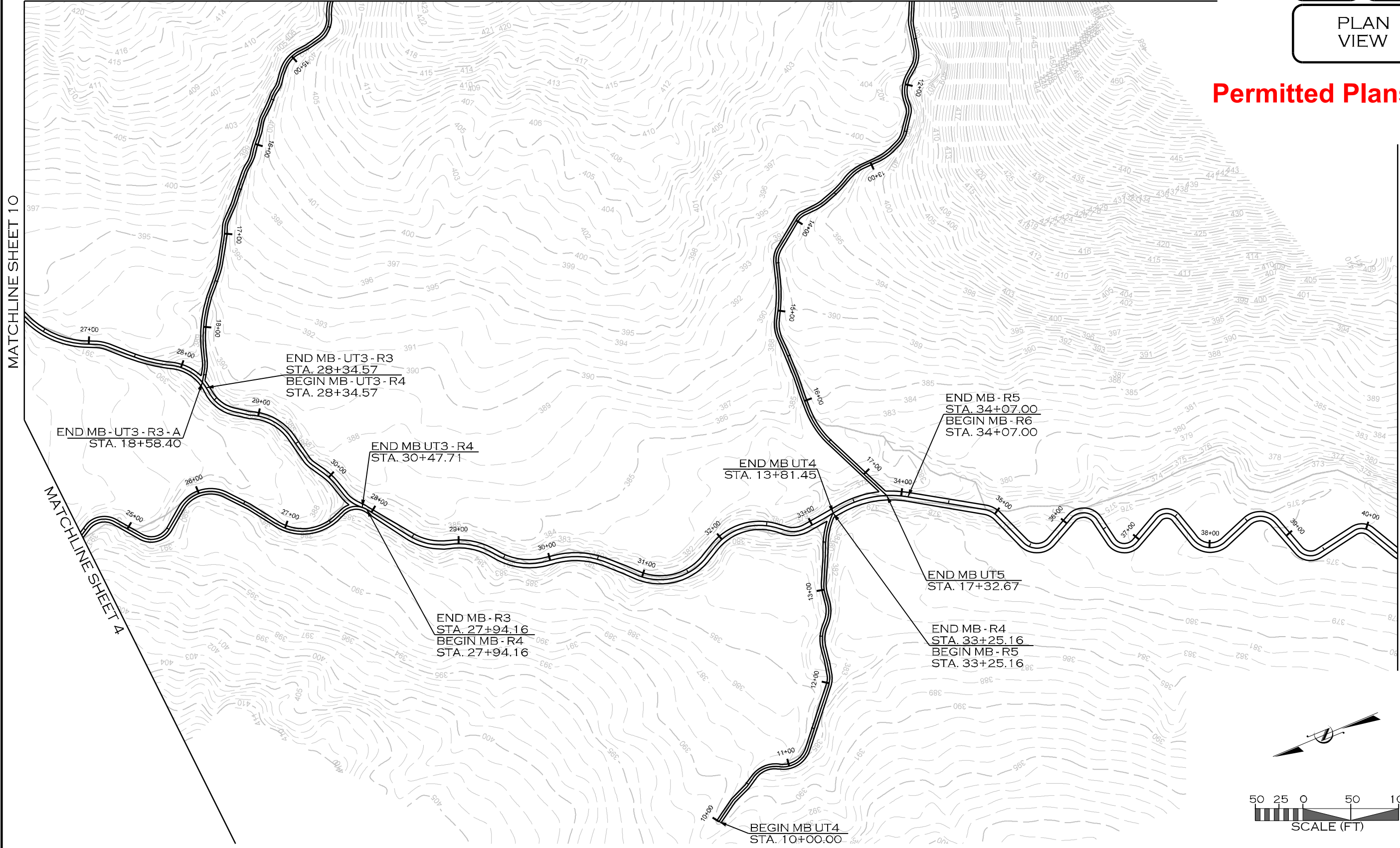
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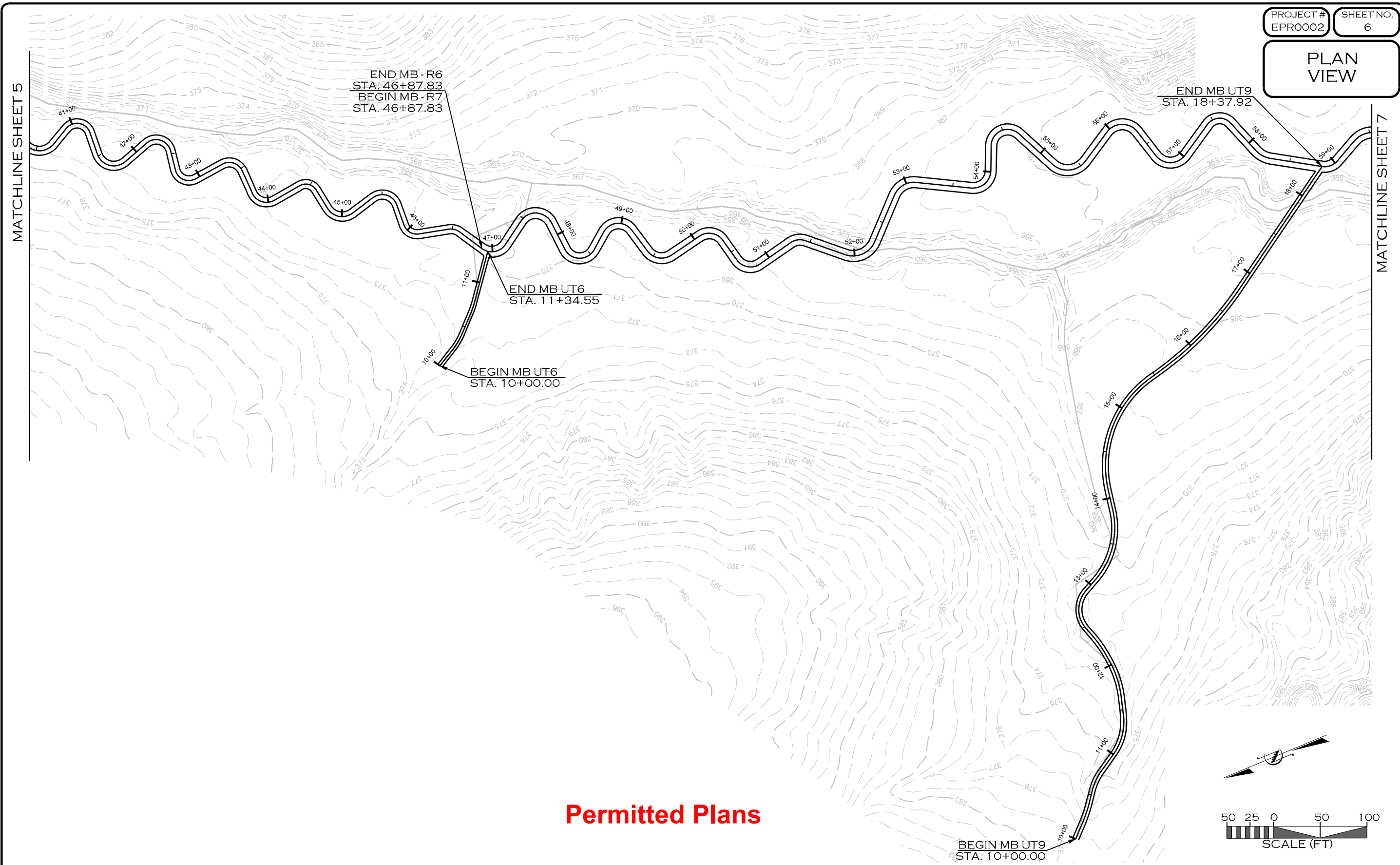
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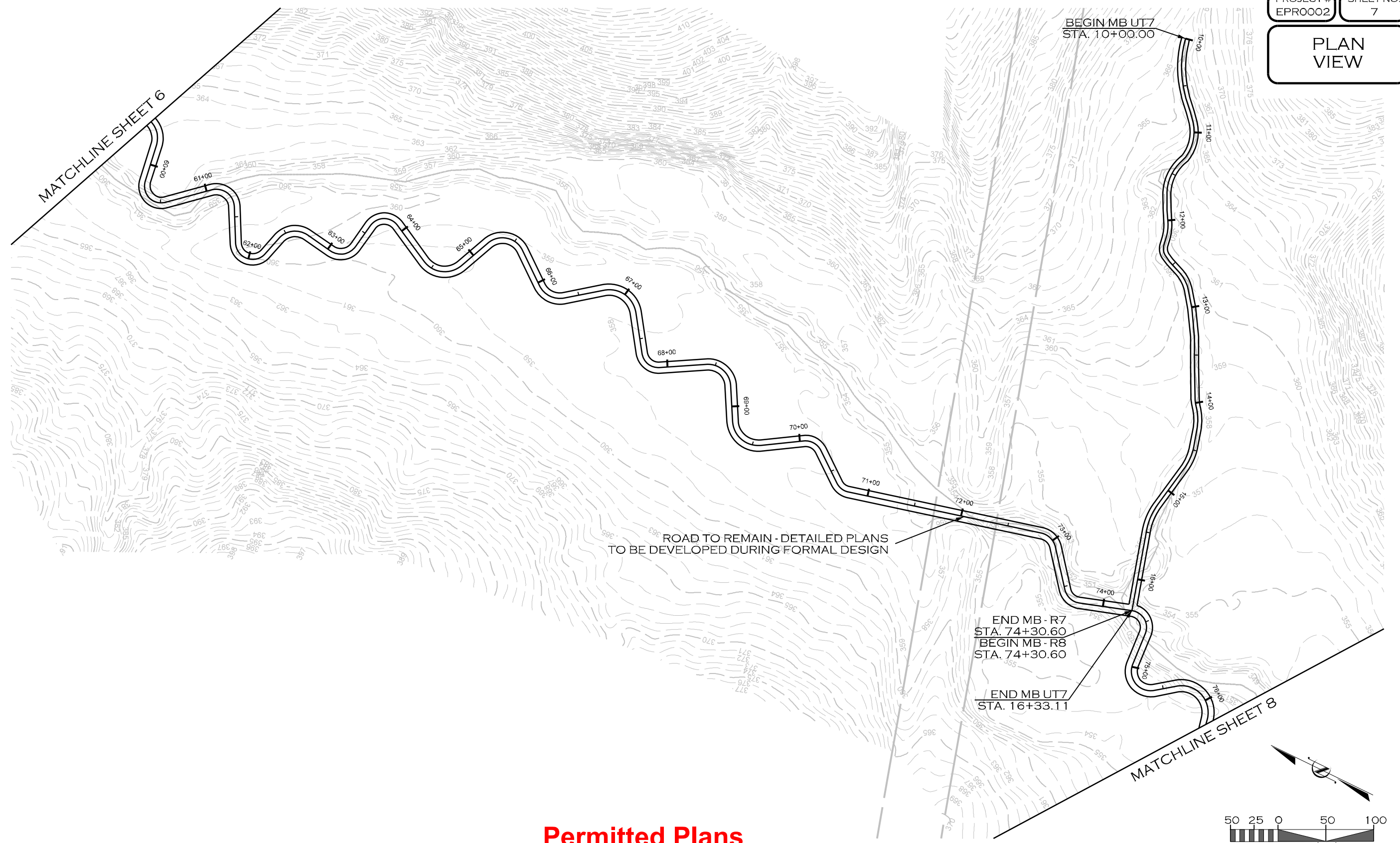
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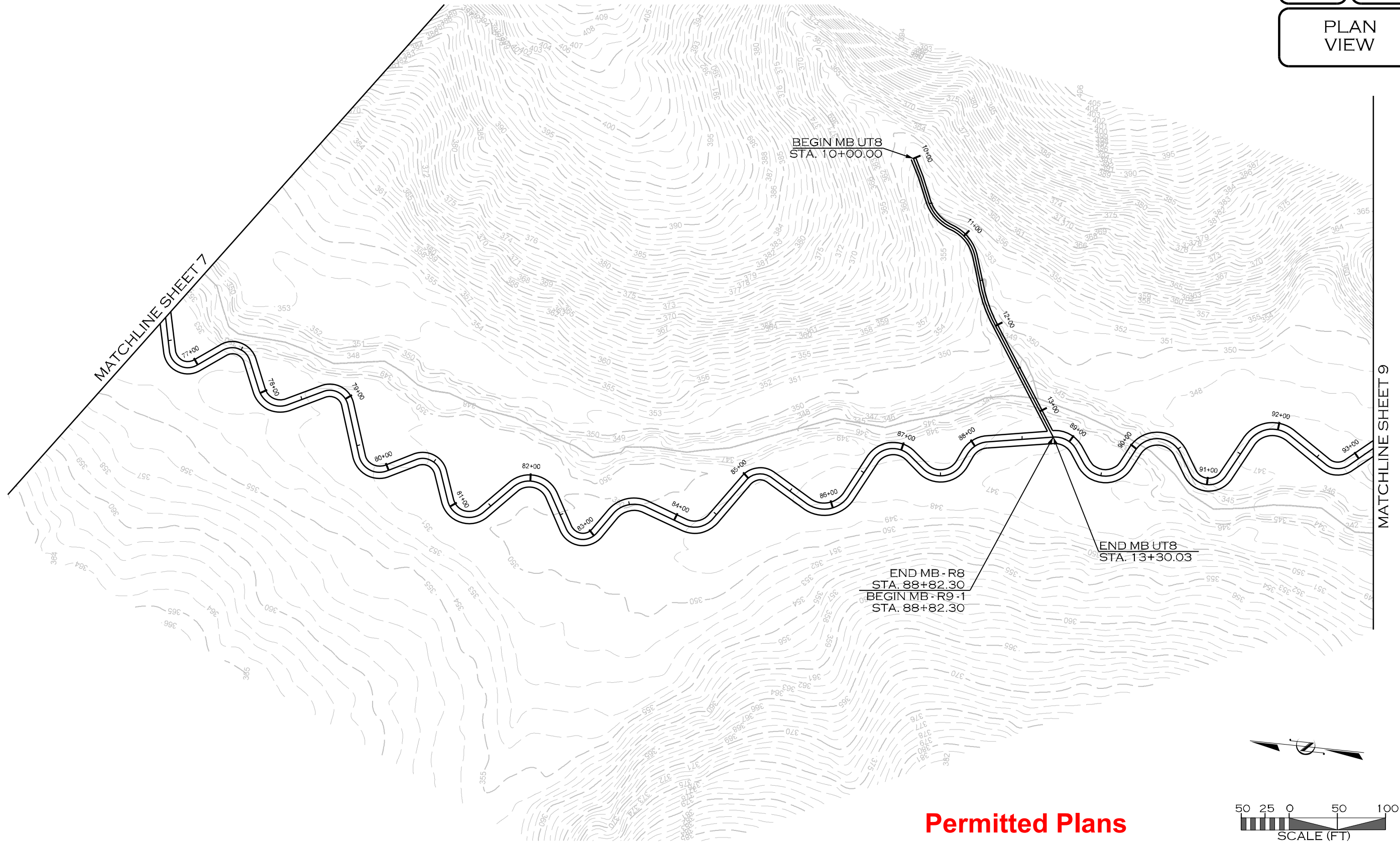
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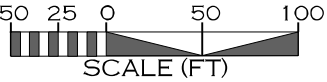
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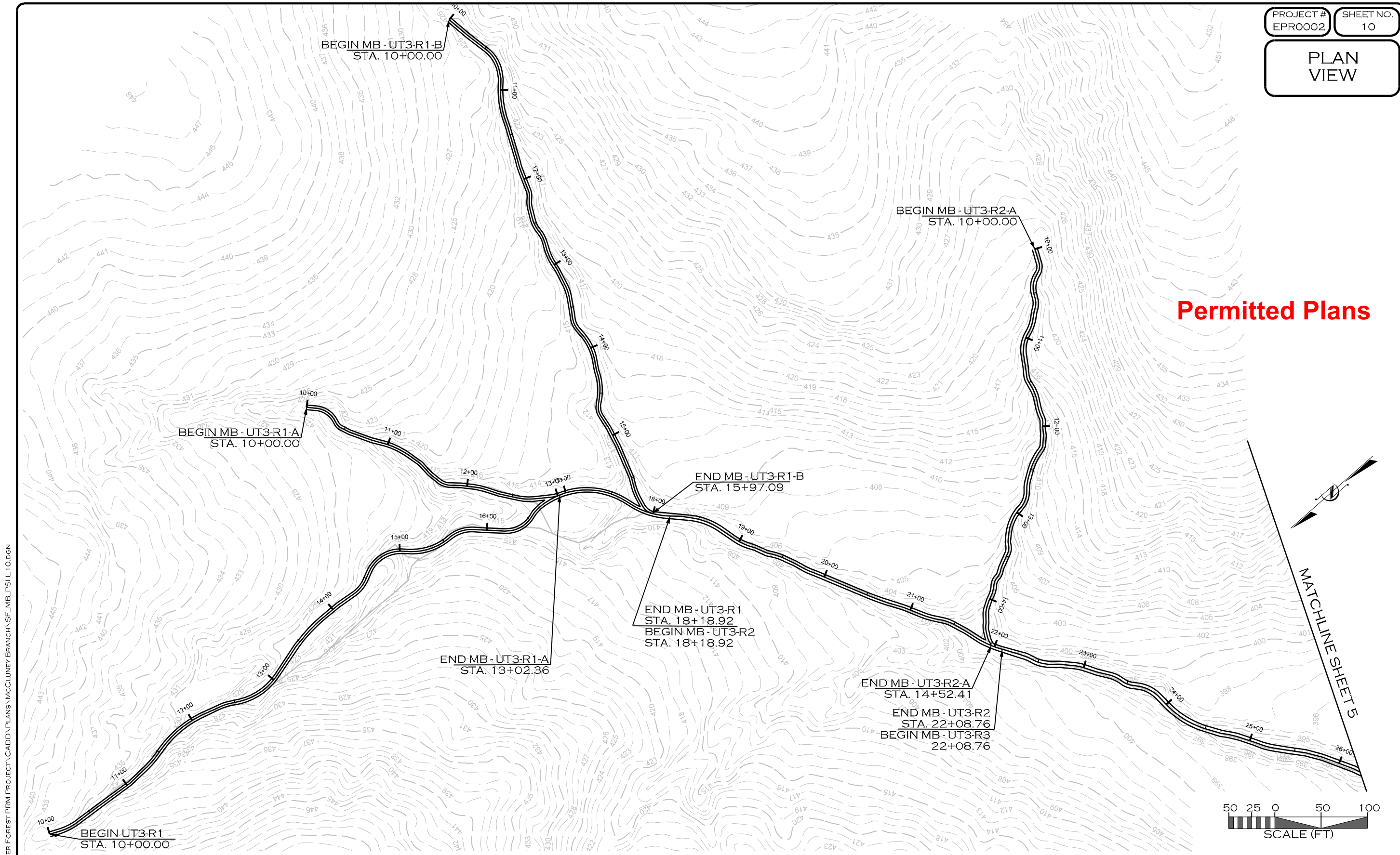
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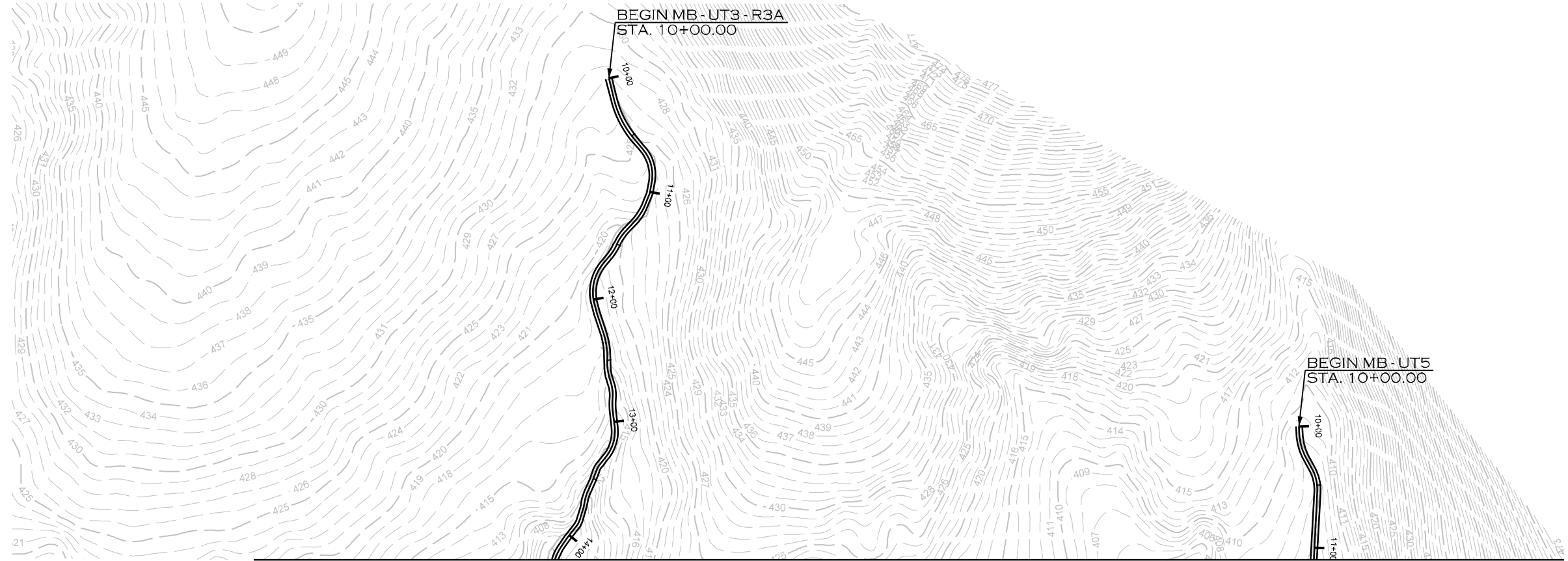


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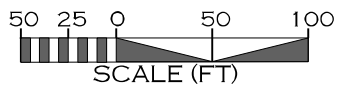
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PLAN  
VIEW



MATCHLINE SHEET 5



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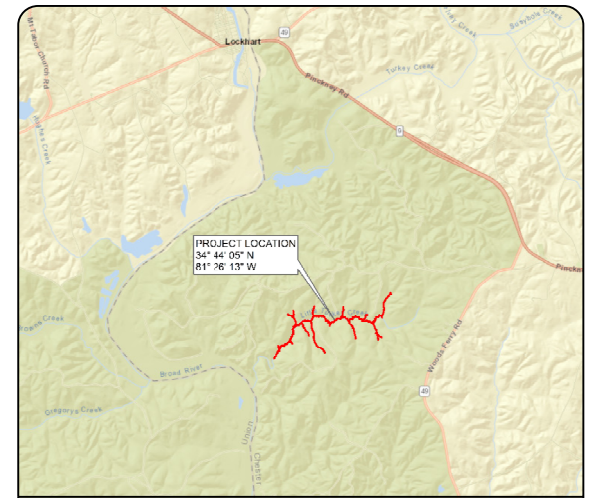
# CHESTER COUNTY

STATE	PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
SC	EPR0002	1	32

PROPOSED DESIGN STREAM LENGTH

EXISTING STREAM LENGTH = 25,465'

PROPOSED STREAM LENGTH = 25,728'



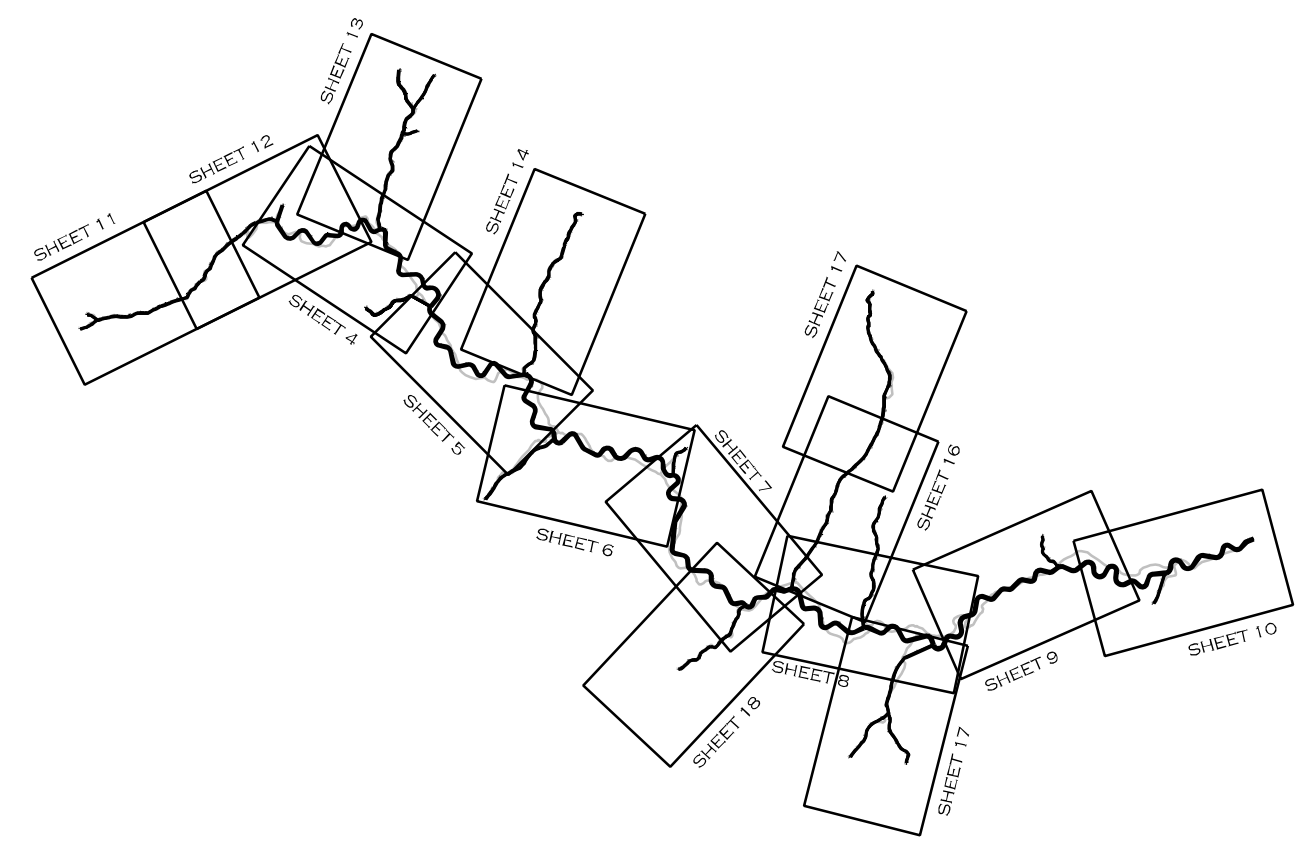
VICINITY MAP

**INDEX OF SHEETS**

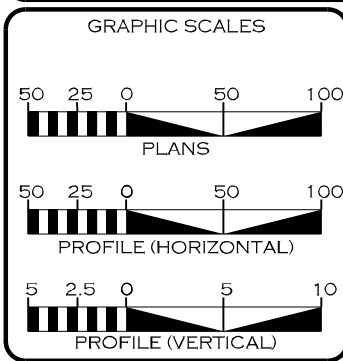
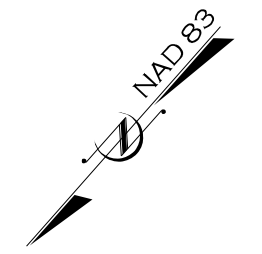
- 1... TITLE SHEET
- 1A... STREAM CONVENTIONAL SYMBOLS  
GENERAL NOTES
- 2... TYPICAL SECTIONS
- 2A-2M... DETAILS
- 3A... TABLES
- 4-18... PLAN VIEW

LOCATION: LITTLE TURKEY CREEK, CHESTER COUNTY, SC  
TYPE OF WORK: STREAM RESTORATION AND  
STREAM ENHANCEMENT

USACE PERMIT NO: SAS-2023-00690



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LETTING DATE: \_\_\_\_\_

ERIN BENNETT, PE  
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











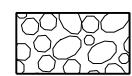




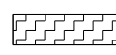
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SYMBOLGY /  
NOTES

STREAM CONVENTIONAL SYMBOLS

- |   |                            |         |               |                           |
|---|----------------------------|---------|---------------|---------------------------|
|    | ROCK J-HOOK                | (JH)    | — SF —        | SAFETY FENCE              |
|    | ROCK VANE                  | (RV)    | — TP —        | TAPE FENCE                |
|    | OFFSET ROCK CROSS VANE     | (OV)    | —     —       | SILT FENCE                |
|    | GRADE CONTROL J-HOOK VANE  | (RJH)   | — CE —        | CONSERVATION EASEMENT     |
|    | ROCK CROSS VANE            | (XV)    | -- 20 --      | EXISTING MAJOR CONTOUR    |
|    | TEMPORARY SILT CHECK       |         | -----         | EXISTING MINOR CONTOUR    |
|    | ROOT WAD                   | (RW)    | -----         | LIMITS OF DISTURBANCE     |
|    | LOG J-HOOK                 | (JH)    | --- 10+00 --- | BANKFULL BENCH (GRADE)    |
|    | LOG VANE                   | (LV)    | —————         | STREAM THALWEG            |
|    | LOG STEP                   | (LS)    | —————         | STREAM TOP OF BANKS       |
|    | ROCK STEP                  | (RS)    | ))            | FOOT BRIDGE               |
|    | LOG CROSS VANE             | (XV)    |               | TEMPORARY STREAM CROSSING |
|    | CONSTRUCTED RIFFLE         | (CR)    |               | PERMANENT STREAM CROSSING |
|    | CONSTRUCTED CASCADE        | (CC)    | ⬇             | TRANSPLANTED VEGETATION   |
|   | WOODY VALLEY GRADE CONTROL | (WV GC) | ⊗             | TREE REMOVAL              |
|  | LOG ROLLER                 | (LR)    | ⊕             | TREE PROTECTION           |
|  | GRADE CONTROL WOODY RIFFLE | (WRF)   | ⊗             | CHANNEL PLUG              |
|  | GEOLIFT                    | (GL)    | ■             | CHANNEL FILL / DITCH PLUG |
|   |                            |         | ▨             | GRADE BANK                |
|   |                            |         | AAA           | LOG STEP POOL (SP)        |
|   |                            |         | ▨             | TOEWOOD (TW)              |
|   |                            |         | ⤴             | SOD MATS (SM)             |
|   |                            |         | ⊗             | DEBRIS JAM (DJ)           |
|   |                            |         | ⤴             | JUNCUS PLUG (JP)          |

\*\*NOTE: ALL ITEMS ABOVE MAY NOT BE USED ON THIS PROJECT

GENERAL NOTES


- NO CONSTRUCTION WORK SHALL COMMENCE BEFORE AN ONSITE MEETING WITH THE ENGINEER, CLIENT, US FOREST SERVICE, AND CONTRACTOR.
- WORK IS BEING PERFORMED AS AN ENVIRONMENTAL RESTORATION PROJECT. THE CONTRACTOR SHALL MAKE ALL REASONABLE EFFORTS TO REDUCE SEDIMENT LOSS AND MINIMIZE DISTURBANCE OF THE SITE WHILE PERFORMING CONSTRUCTION WORK.
- THE CONTRACTOR IS REQUIRED TO INSTALL INSTREAM STRUCTURES USING A TRACK HOE EXCAVATOR WITH A HYDRAULIC THUMB OF SUFFICIENT SIZE TO PLACE BOULDERS AND STRUCTURES.
- CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL UTILITIES ARE ADEQUATELY LOCATED AND MARKED DURING CONSTRUCTION.
- ANY DAMAGE TO EXISTING ROADS, STRUCTURES, FACILITIES, ETC. RESULTING FROM ACTIONS OF THE CONTRACTOR WILL BE REPAIRED OR REPLACED AT THE EXPENSE OF THE CONTRACTOR, TO A QUALITY MEETING OR EXCEEDING THE PREVIOUS STANDARDS.
- WORK IS BEING PERFORMED IN A NATIONAL FOREST WITH PUBLIC ACCESS. CONTRACTOR SHALL ENSURE THAT ALL WORK IS CONDUCTED SAFELY, AND THAT THE SAFETY OF THE GENERAL PUBLIC IS ENSURED DURING ALL PHASES OF THE CONSTRUCTION WORK.
- IN THE EVENT OF A SPILL OR ILLICIT DISCHARGE, CONTACT THE ENOREE RANGER DISTRICT OFFICE AT (803) 276-4810.
- CONTRACTOR SHALL INSPECT ALL SAFETY AND EROSION CONTROL DEVICES, STRUCTURES, AND WORKS AT THE START OF EACH WORK DAY TO ENSURE THEY ARE PROPERLY PLACED AND FUNCTIONING.
- CONTRACTOR SHALL MAINTAIN ALL VEHICLES AND EQUIPMENT TO PREVENT DISCHARGE OF FUEL OR FLUIDS. ANY IDENTIFIED LEAKING EQUIPMENT SHALL BE REMOVED FROM THE WORK AREA AND SHALL BE REPAIRED AS SOON AS FEASIBLE.

10/25/2023  
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Permitted Plans

REVISIONS				
NO.	DESCRIPTION	ENGR.	APPROV	DATE
1	PERMITTING DESIGN PLANS	EB	KLT	10/25/23

PREPARED FOR:



SC DEPARTMENT OF COMMERCE  
FOR SCOUT MOTORS

SUMTER NATIONAL FOREST  
ENROEE RANGER DISTRICT  
STREAM AND RIPARIAN RESTORATION/  
ENHANCEMENT PROJECT  
LITTLE TURKEY CREEK WATERSHED  
CHESTER COUNTY, SOUTH CAROLINA

PREPARED IN THE OFFICE OF:



1150 SE MAYNARD RD, SUITE 140  
CARY, NC 27511  
LICENSE # 5371

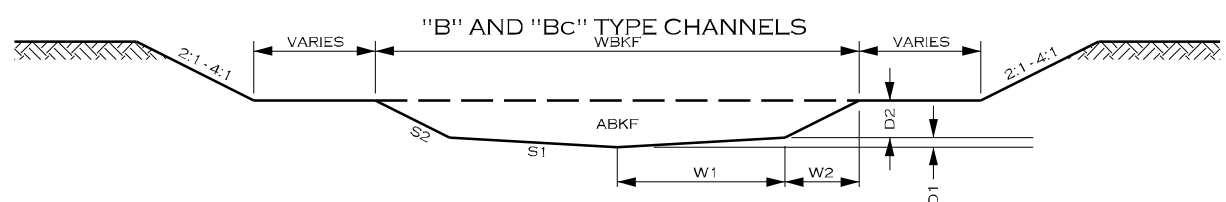
PROJECT ENGINEER

PROGRESS DRAWING  
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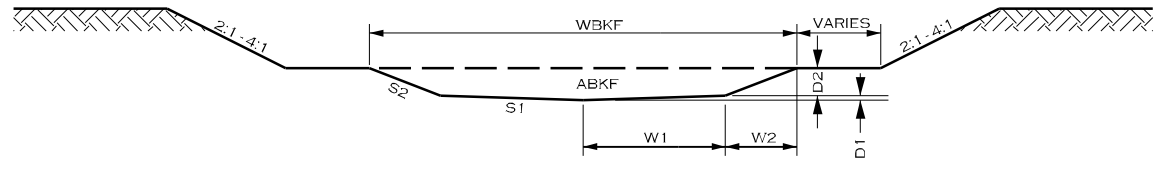


TYPICAL SECTIONS

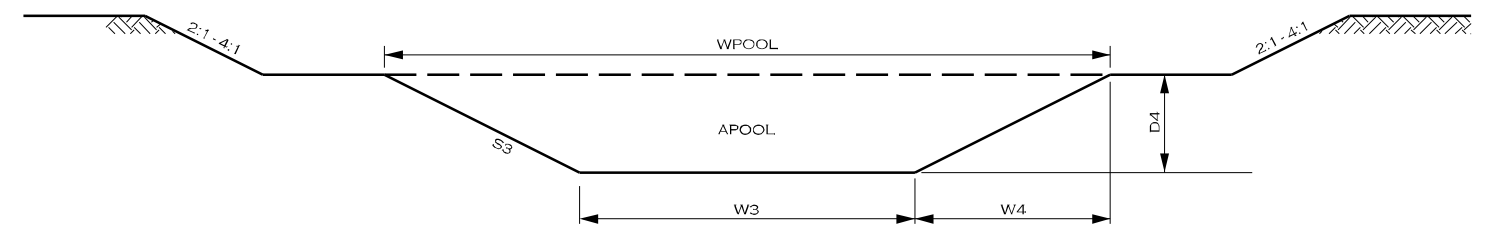
DETAILS



TYPICAL RIFFLE CROSS SECTION



TYPICAL RIFFLE CROSS SECTION



TYPICAL POOL RIGHT CROSS SECTION

C, Cb, E STREAM, and MEANDERING TYPE REPRESENTATIVE CROSS SECTION DIMENSIONS																					
Stream	Sheet Range	Station Range	RIFFLES								POOLS										
			ABKF	WBKF	W1	W2	D1	D2	S1	S2	APOOL	WPOOL	W3	W4	W5	W6	D3	D4	S3	S4	S6
LTC - R1	4	10+00.00 - 11+30.89	18.4	14.9	3.3	4.1	0.21	1.65	16:1	2.5:1	44.9	22.3	7.4	3.7	3.7	7.4	1.86	1.86	4:1	2:1	2:1
LTC - R2	4	11+30.89 - 22+63.77	20.1	15.5	3.5	4.3	0.22	1.73	16:1	2.5:1	49.0	23.3	7.8	3.9	3.9	7.8	1.94	1.94	4:1	2:1	2:1
LTC - R3	4 - 5	22+63.77 - 32+12.03	23.0	16.6	3.7	4.6	0.23	1.85	16:1	2.5:1	56.1	24.9	8.3	4.2	4.2	8.3	2.08	2.08	4:1	2:1	2:1
LTC - R4	5	32+12.03 - 44+78.67	24.4	17.1	3.8	4.8	0.24	1.90	16:1	2.5:1	59.5	25.7	8.6	4.3	4.3	8.6	2.14	2.14	4:1	2:1	2:1
LTC - R5	5 - 6	44+78.67 - 51+87.39	25.8	17.6	3.9	4.9	0.24	1.96	16:1	2.5:1	62.9	26.4	8.8	4.4	4.4	8.8	2.20	2.20	4:1	2:1	2:1
LTC - R6	6 - 7	51+87.39 - 64+28.07	27.6	18.2	4.0	5.1	0.25	2.02	16:1	2.5:1	67.3	27.3	9.1	4.5	4.5	9.1	2.27	2.27	4:1	2:1	2:1
LTC - R7	7 - 8	64+28.07 - 84+05.11	29.9	18.9	4.2	5.3	0.26	2.10	16:1	2.5:1	72.9	28.4	9.5	4.7	4.7	9.5	2.37	2.37	4:1	2:1	2:1
LTC - R8	8	84+05.11 - 92+20.66	31.0	19.3	4.3	5.4	0.27	2.14	16:1	2.5:1	75.6	28.9	9.6	4.8	4.8	9.6	2.41	2.41	4:1	2:1	2:1
LTC - R9	8	92+20.66 - 98+87.17	31.8	19.5	4.3	5.4	0.27	2.17	16:1	2.5:1	77.5	29.3	9.8	4.9	4.9	9.8	2.44	2.44	4:1	2:1	2:1
LTC - R10	8 - 9	98+87.17 - 112+71.50	33.5	20.0	4.5	5.6	0.28	2.23	16:1	2.5:1	81.7	30.1	10.0	5.0	5.0	10.0	2.51	2.51	4:1	2:1	2:1
LTC - R11	9 - 10	112+71.50 - 124+23.49	34.0	20.2	4.5	5.6	0.28	2.24	16:1	2.5:1	82.9	30.3	10.1	5.0	5.0	10.1	2.52	2.52	4:1	2:1	2:1
LTC - R12	10	124+23.49 - 133+36.39	35.7	20.7	4.6	5.7	0.29	2.30	16:1	2.5:1	87.0	31.0	10.3	5.2	5.2	10.3	2.59	2.59	4:1	2:1	2:1

B, Bc, and STEP-POOL STREAM TYPE REPRESENTATIVE CROSS SECTION DIMENSIONS																					
Stream	Sheet Range	Station Range	RIFFLES								POOLS										
			ABKF	WBKF	W1	W2	D1	D2	S1	S2	APOOL	WPOOL	W3	W4	D4	S3					
LTC-UT1-R1	11	10+00.00 - 11+52.06	3.3	6.3	1.4	1.7	0.09	0.7	16:1	2.5:1	7.3	9.4	1.3	4.1	1.36	3:1					
LTC-UT1-R1a	11	10+00.00 - 10+90.29	2.7	5.7	1.3	1.6	0.08	0.63	16:1	2.5:1	6.0	8.5	1.1	3.7	1.23	3:1					
LTC-UT1-R2-1	11	11+52.06 - 13+76.72	6.1	8.6	1.9	2.4	0.12	0.95	16:1	2.5:1	13.5	12.8	1.7	5.6	1.85	3:1					
LTC-UT1-R2-2	11 - 12	13+76.72 - 24+51.63	6.1	8.6	1.9	2.4	0.12	0.95	16:1	2.5:1	13.5	12.8	1.7	5.6	1.85	3:1					
LTC-UT1-R2-3	12, 4	24+51.63 - 28+47.68	6.1	8.6	1.9	2.4	0.12	0.95	16:1	2.5:1	13.5	12.8	1.7	5.6	1.85	3:1					
LTC-UT2-R1	13	10+00.00 - 13+30.70	5.9	8.4	1.9	2.3	0.12	0.93	16:1	2.5:1	13.0	12.6	1.7	5.5	1.82	3:1					
LTC-UT2-R1a	13	10+00.00 - 13+09.56	2.1	5.0	1.1	1.4	0.07	0.56	16:1	2.5:1	4.6	7.5	1.0	3.3	1.09	3:1					
LTC-UT2-R2	13	13+30.70 - 15+53.98	6.5	8.8	2.0	2.5	0.12	0.98	16:1	2.5:1	14.4	13.2	1.8	5.7	1.91	3:1					
LTC-UT2-R2a	13	10+00.00 - 11+20.22	2.1	5.0	1.1	1.4	0.07	0.56	16:1	2.5:1	4.6	7.5	1.0	3.3	1.09	3:1					
LTC-UT2-R3-1	13	15+53.98 - 20+57.71	7.4	9.4	2.1	2.6	0.13	1.05	16:1	2.5:1	16.4	14.1	1.9	6.1	2.04	3:1					
LTC-UT2-R3-2	13, 4	20+57.71 - 23+45.09	7.4	9.4	2.1	2.6	0.13	1.05	16:1	2.5:1	16.4	14.1	1.9	6.1	2.04	3:1					
LTC-UT3	4 - 5	10+00.00 - 15+83.64	4.1	7.0	1.6	1.9	0.10	0.78	16:1	2.5:1	9.1	10.5	1.4	4.6	1.52	3:1					
LTC-UT4	14, 5	10+00.00 - 24+25.83	4.6	7.4	1.7	2.1	0.10	0.83	16:1	2.5:1	10.2	11.1	1.5	4.8	1.61	3:1					
LTC-UT5-R2	6	10+00.00 - 17+24.14	5.8	8.3	1.9	2.3	0.12	0.93	16:1	2.5:1	12.8	12.5	1.7	5.4	1.81	3:1					
LTC-UT6	7	10+00.00 - 12+60.30	3.5	6.5	1.4	1.8	0.09	0.72	16:1	2.5:1	7.7	9.7	1.3	4.2	1.40	3:1					
LTC-UT7-1	15 - 16	10+00.00 - 29+70.16	4.0	6.9	1.5	1.9	0.10	0.77	16:1	2.5:1	8.8	10.4	1.4	4.5	1.50	3:1					
LTC-UT7-2	16, 8	29+70.16 - 35+87.31	4.0	6.9	1.5	1.9	0.10	0.77	16:1	2.5:1	8.8	10.4	1.4	4.5	1.50	3:1					
LTC-UT8	16, 8	10+00.00 - 20+80.35	3.4	6.4	1.4	1.8	0.09	0.71	16:1	2.5:1	7.5	9.6	1.3	4.2	1.38	3:1					
LTC-UT9-R1	18	10+00.00 - 14+41.28	3.9	6.8	1.5	1.9	0.10	0.76	16:1	2.5:1	8.6	10.3	1.4	4.4	1.48	3:1					
LTC-UT9-R1a	18	10+00.00 - 14+63.89	3.0	6.0	1.3	1.7	0.08	0.67	16:1	2.5:1	6.6	9.0	1.2	3.9	1.30	3:1					
LTC-UT9-R2	18, 8	14+41.28 - 21+38.66	5.7	8.3	1.8	2.3	0.11	0.92	16:1	2.5:1	12.6	12.4	1.7	5.4	1.79	3:1					
LTC-UT10	9	10+00.00 - 13+04.80	2.2	5.1	1.1	1.4	0.07	0.57	16:1	2.5:1	4.9	7.7	1.0	3.3	1.11	3:1					
LTC-UT11	10	10+00.00 - 12+49.60	5.5	8.1	1.8	2.3	0.11	0.90	16:1	2.5:1	12.2	12.2	1.6	5.3	1.76	3:1					
LTC-UT12-R1	17	10+00.00 - 13+45.33	4.3	7.2	1.6	2.0	0.10	0.80	16:1	2.5:1	9.5	10.8	1.4	4.7	1.56	3:1					
LTC-UT12-R2	17, 7	13+45.33 - 17+69.90	4.4	7.3	1.6	2.0	0.10	0.81	16:1	2.5:1	9.7	10.9	1.5	4.7	1.57	3:1					

Permitted Plans

REVISIONS				
NO.	DESCRIPTION	ENGR.	APPROV.	DATE
1	PERMITTING DESIGN PLANS	EB	KLT	10/25/23

PREPARED FOR:

SC DEPARTMENT OF COMMERCE FOR SCOUT MOTORS

SUMTER NATIONAL FOREST  
ENROEE RANGER DISTRICT  
STREAM AND RIPARIAN RESTORATION/  
ENHANCEMENT PROJECT  
LITTLE TURKEY CREEK WATERSHED  
CHESTER COUNTY, SOUTH CAROLINA

PREPARED IN THE OFFICE OF:

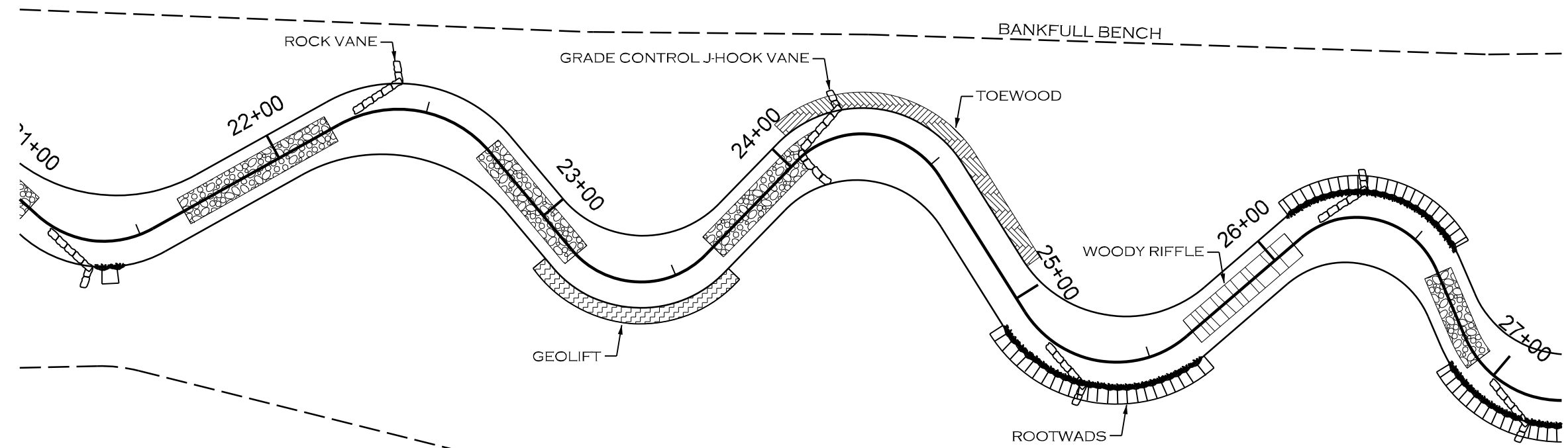
1150 SE MAYNARD RD, SUITE 140  
CARY, NC 27511  
LICENSE # 5371

PROJECT ENGINEER

PROGRESS DRAWING  
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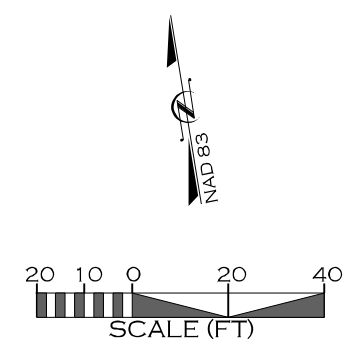
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TYPICAL STRUCTURE PLACEMENT  
MEANDERING CHANNEL DESIGN

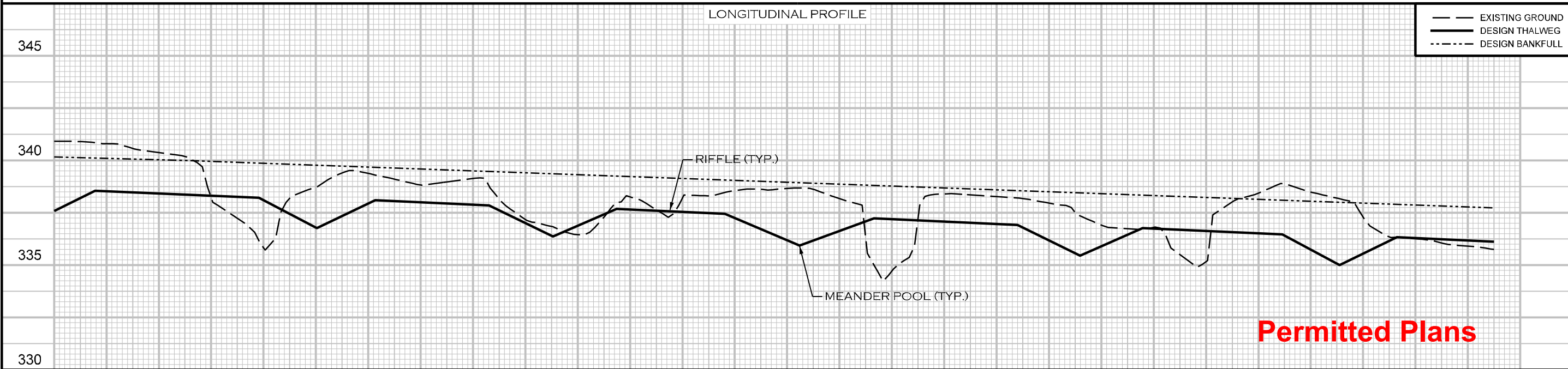


NOTES:

1. THIS DETAIL ILLUSTRATES TYPICAL PLACEMENT OF IN-STREAM AND BANK PROTECTION STRUCTURES TO BE USED IN MEANDERING CHANNEL DESIGNS. PLACEMENT AND TYPES OF STRUCTURES MAY VARY.
2. MEANDERING CHANNEL STRUCTURES ARE TYPICALLY USED FOR BANK PROTECTION, HABITAT, AND GRADE CONTROL, AND TYPICALLY FOR REACHES EQUAL TO OR LESS THAN 1.5% SLOPE.
3. GRADE CONTROL STRUCTURES SHALL BE PLACED TO PREVENT PIPING, EXCESSIVE SCOUR, AND STREAM INCISION AROUND STRUCTURE.
4. SEE DETAILS FOR SPECIFIC STRUCTURES FOR MORE INFORMATION.



LONGITUDINAL PROFILE



21+50      22+00      23+00      24+00      25+00      26+00      27+00

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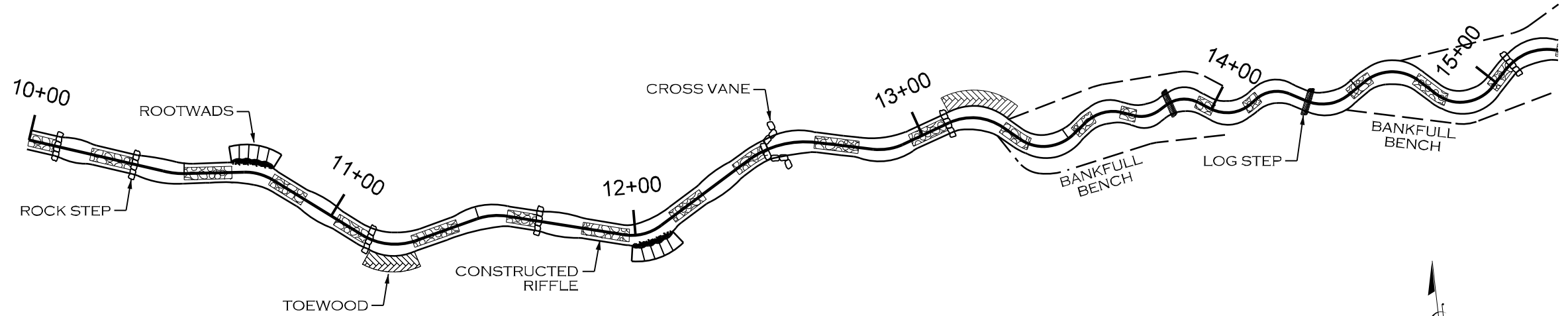


TYPICAL STRUCTURE PLACEMENT  
STEP - POOL CHANNEL DESIGN

PROJECT #  
EPRO002

SHEET NO.  
2B

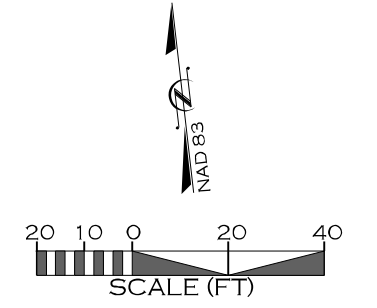
DETAILS



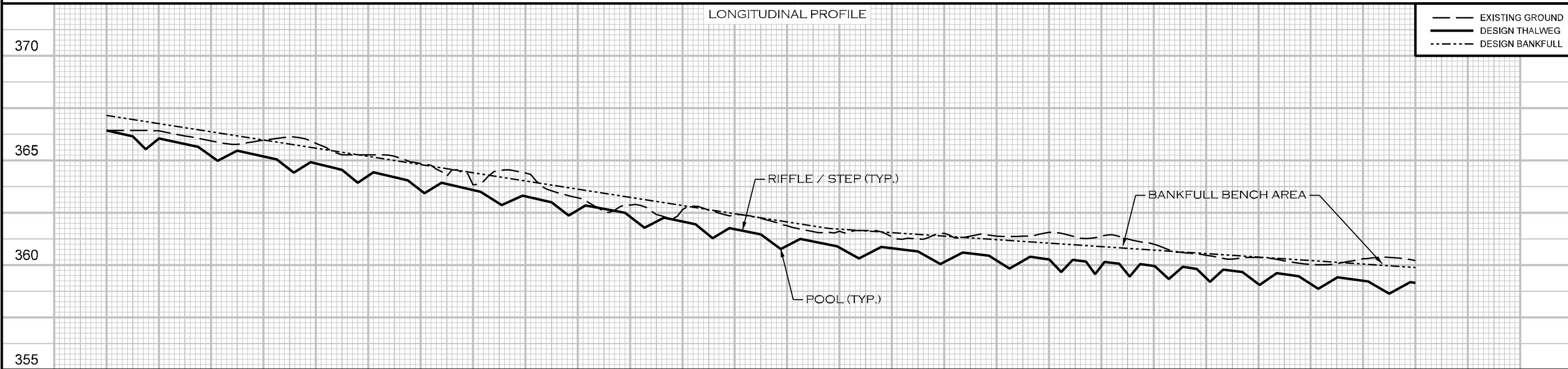
NOTES:

1. THIS DETAIL ILLUSTRATES TYPICAL PLACEMENT OF IN-STREAM AND BANK PROTECTION STRUCTURES TO BE USED IN STEP-POOL CHANNEL DESIGNS. PLACEMENT AND TYPES OF STRUCTURES MAY VARY.
2. STEP-POOL STRUCTURES ARE TYPICALLY USED FOR REACHES WITH SLOPES IN EXCESS OF 1.5%.
3. GRADE CONTROL STRUCTURES SHALL BE PLACED TO PREVENT PIPING, EXCESSIVE SCOUR, AND STREAM INCISION AROUND STRUCTURE
4. SEE DETAILS FOR SPECIFIC STRUCTURES FOR MORE INFORMATION.

Permitted Plans



LONGITUDINAL PROFILE




--- EXISTING GROUND  
— DESIGN THALWEG  
- - - DESIGN BANKFULL

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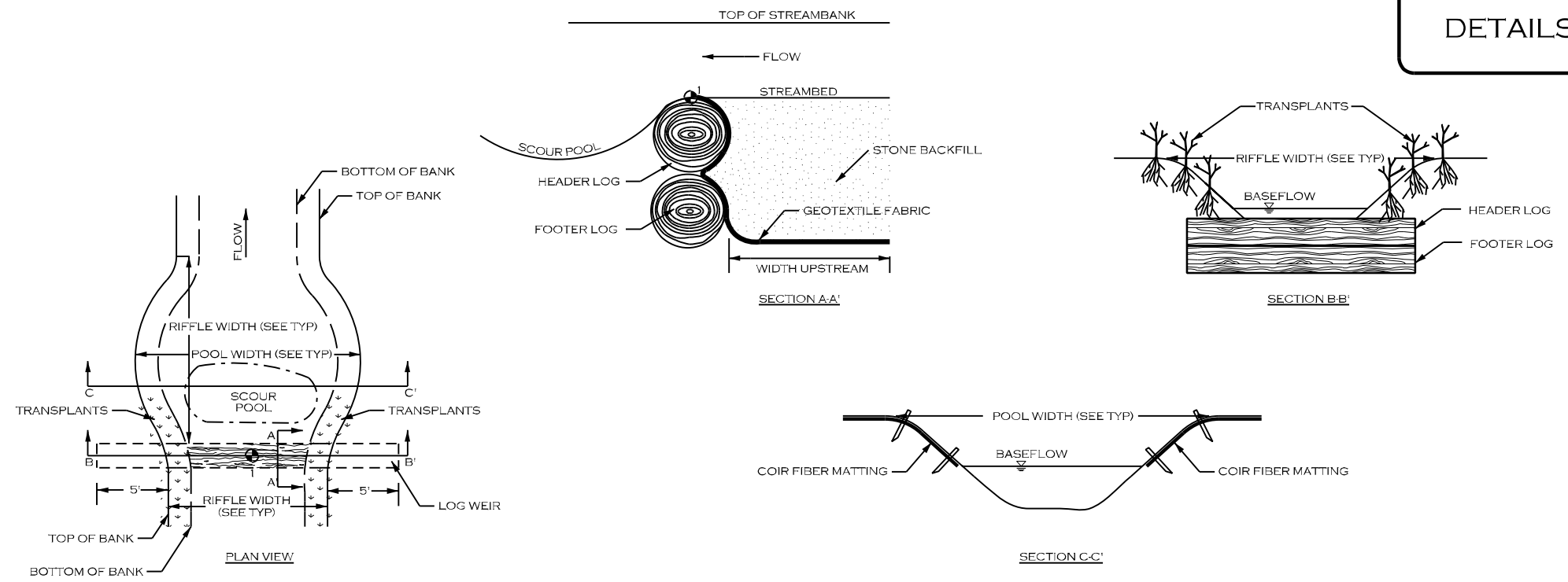
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**LOG STEP** (LS)

**DETAILS**

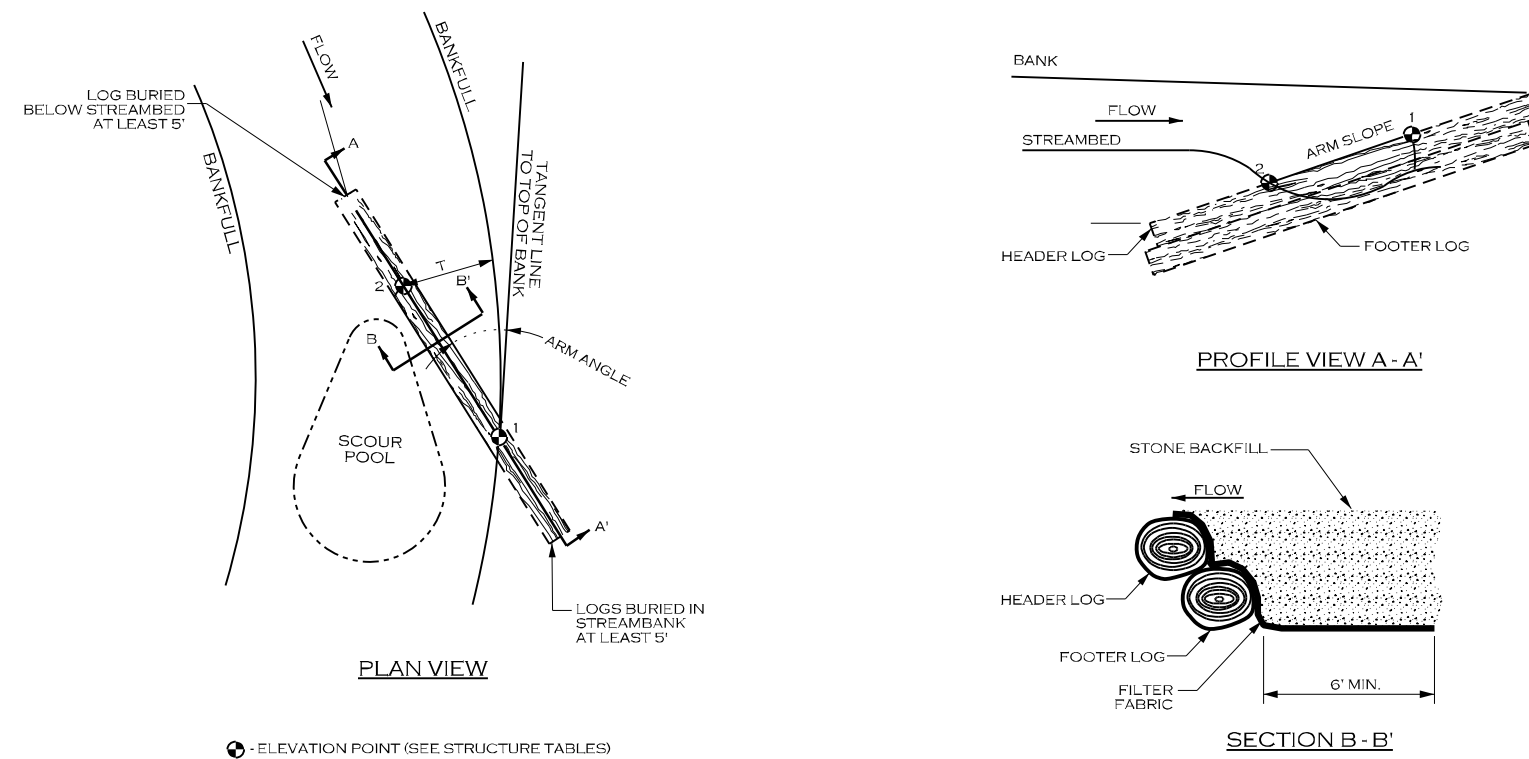
⊙ - ELEVATION POINT (SEE STRUCTURES TABLE)

LOG STEP SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
LOGS	TYPE: HARDWOOD SIZE: 20 FT LONG, 12 INCH Ø MIN NUMBER OF HEADER LOGS: 1 NUMBER OF FOOTER LOGS: 1
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
<b>NOTES FOR LOG STEP STRUCTURES:</b> 1. LOGS SHOULD BE AT LEAST 12 INCHES IN DIAMETER, RELATIVELY STRAIGHT, HARDWOOD, AND RECENTLY HARVESTED. 2. LOGS > 24 INCHES IN DIAMETER MAY BE USED ALONE WITHOUT AN ADDITIONAL LOG. GEOTEXTILE FABRIC SHOULD STILL BE USED TO SEAL AROUND LOG. 3. PLACE FOOTER LOGS FIRST AND THEN HEADER (TOP) LOG. SET HEADER LOG APPROXIMATELY 3 INCHES ABOVE THE INVERT ELEVATION. 4. CUT A NOTCH IN THE HEADER LOG APPROXIMATELY 50 PERCENT OF THE CHANNEL BOTTOM WIDTH AND EXTENDING DOWN TO THE INVERT ELEVATION. 5. USE GEOTEXTILE FABRIC TO SEAL GAPS BETWEEN LOGS. 6. PLACE TRANSPLANTS FROM TOE OF STREAMBANK TO TOP OF STREAMBANK. 7. TRANSPLANTS CAN BE SUBSTITUTED WITH LIVE STAKES AT THE DIRECTION OF THE ENGINEER.	



**LOG VANE** (LV)

LOG VANE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
LOGS	TYPE: HARDWOOD SIZE: SEE NOTES. NUMBER OF HEADER LOGS: 1 NUMBER OF FOOTER LOGS: 1
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
STONE BACKFILL	CLASS A AND 57 STONE (50/50 MIX)
<b>NOTES FOR LOG VANE STRUCTURES:</b> 1. STRUCTURE DIMENSIONS AND STRUCTURE MEASUREMENTS ARE SHOWN ON THE STRUCTURE TABLES SHEET. 2. LOGS SHOULD BE STRAIGHT, HARDWOOD, AND NOT ROTTEN. 3. SOIL SHOULD BE COMPACTED WELL AROUND BURIED PORTIONS OF LOGS. 4. FILTER FABRIC SHOULD BE NAILED TO THE LOG BELOW THE BACKFILL. 5. LOGS 12 INCH DIAMETER MINIMUM.	



⊙ - ELEVATION POINT (SEE STRUCTURE TABLES)

**Permitted Plans**

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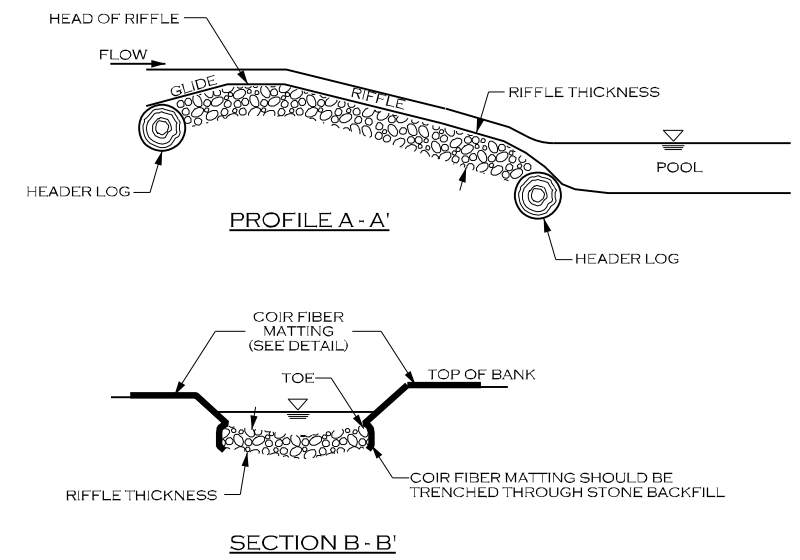
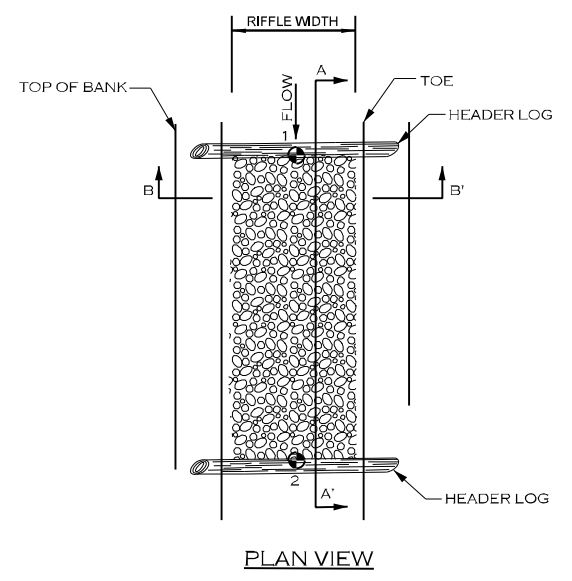
PROJECT ENGINEER

**PROGRESS DRAWING**  
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DETAILS

CONSTRUCTED RIFFLE (CR)



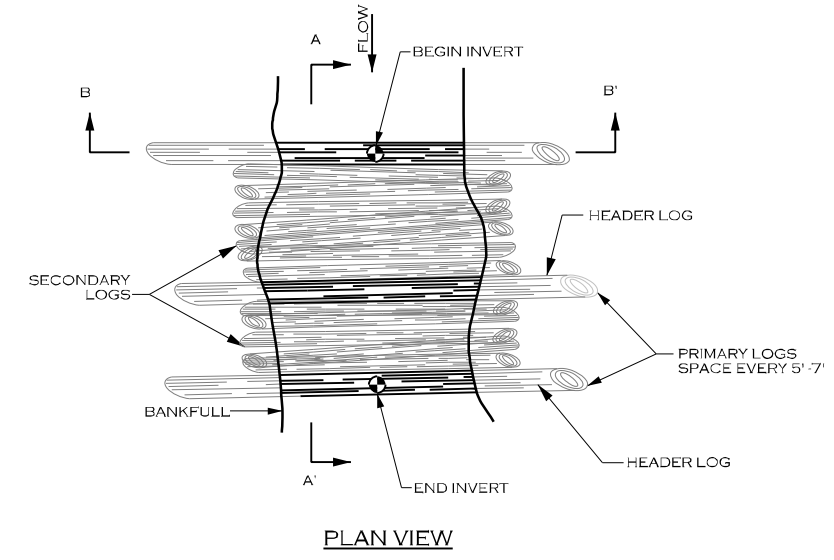
• ELEVATION POINT (SEE STRUCTURES TABLE)

CONSTRUCTED RIFFLE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
STONE BACKFILL	TYPE: GRANITE OR COMPARABLE SIZE: CLASS A AND CLASS B STONE (50/50 MIX) THICKNESS: 16 INCHES MIN.
COIR FIBER MATTING	SEE MATTING DETAIL

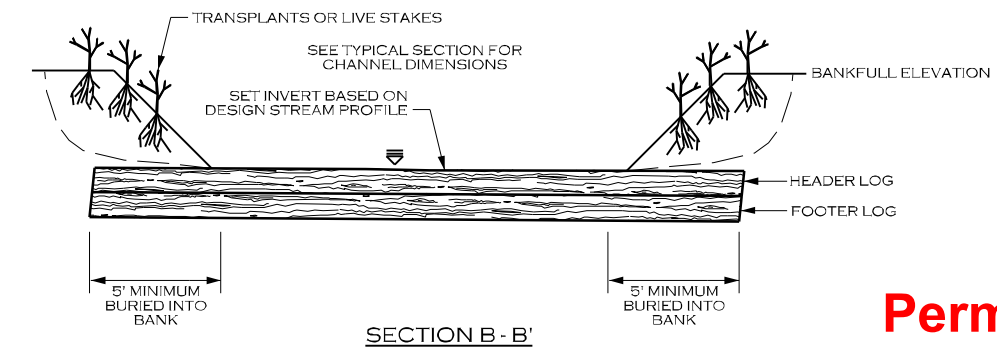
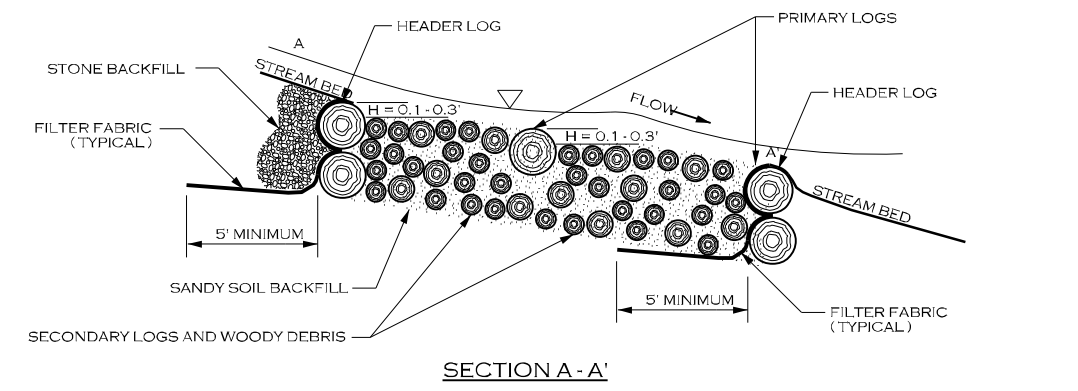
NOTES FOR CONSTRUCTED RIFFLE STRUCTURES:

- GRADE STREAMBED AND BANKS TO PROPOSED DIMENSIONS PER TYPICAL CROSS SECTION AND PROFILE.
- EXCAVATE TRENCH BELOW PROPOSED STREAMBED ELEVATION EQUAL TO OR GREATER THAN RIFFLE THICKNESS.
- INSTALL COIR FIBER MATTING ALONG STREAMBANKS ENSURING MATTING IS SUFFICIENTLY TRENCHED ALONG TOP OF BANK.
- FILL TRENCH WITH STONE TO FINAL DESIGN STREAM GRADE.

GRADE CONTROL WOODY RIFFLE (WR)



• ELEVATION POINT (SEE STRUCTURES TABLE)



- NOTES:
- PRIMARY LOGS SHOULD BE AT LEAST 10" OR MORE IN DIAMETER, RELATIVELY STRAIGHT, AND RECENTLY HARVESTED AND EXTENDING INTO THE BANK 5' ON EACH SIDE.
  - SECONDARY LOGS SHOULD BE AT LEAST 1" IN DIAMETER AND NO LARGER THAN 10", AND EXTEND INTO THE BANK 2 FEET ON EACH SIDE. WOOD MATERIAL SHALL BE VARYING DIAMETER TO ALLOW MATERIAL TO BE COMPACTED.
  - FILTER FABRIC SHOULD BE NAILED TO THE HEADER LOG BELOW THE BACKFILL.
  - ROOTWADS AND COIR FIBER MATTING CAN BE USED INSTEAD OF TRANSPLANTS OR LIVE STAKES, PER DIRECTION OF ENGINEER.
  - AFTER TRENCH HAS BEEN EXCAVATED A LAYER OF SECONDARY LOGS AND WOODY DEBRIS SHOULD BE PLACED WITH MINIMAL GAPS. A LAYER OF ON-SITE ALLUVIUM SHOULD BE APPLIED TO FILL VOIDS BETWEEN SECONDARY LOGS BEFORE ADDITIONAL LAYERS ARE PLACED.

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SC DEPARTMENT OF COMMERCE  
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SUMTER NATIONAL FOREST  
ENROEE RANGER DISTRICT  
STREAM AND RIPARIAN RESTORATION/  
ENHANCEMENT PROJECT  
LITTLE TURKEY CREEK WATERSHED  
CHESTER COUNTY, SOUTH CAROLINA

PREPARED IN THE OFFICE OF:

1150 SE MAYNARD RD, SUITE 140  
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LICENSE # 5371

PROJECT ENGINEER

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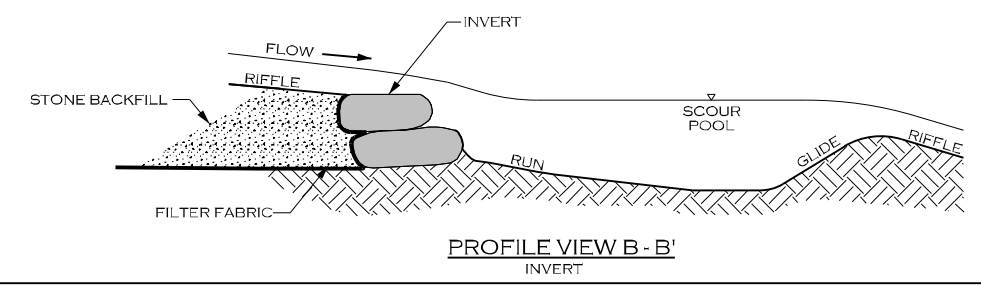
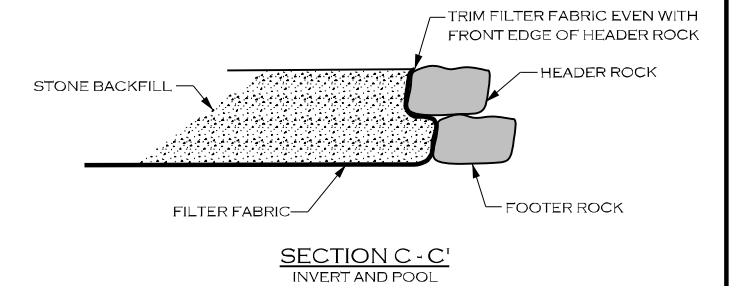
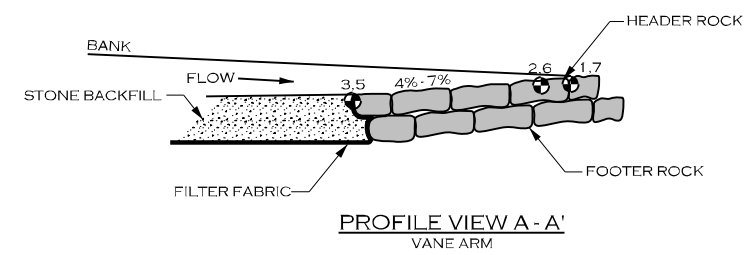
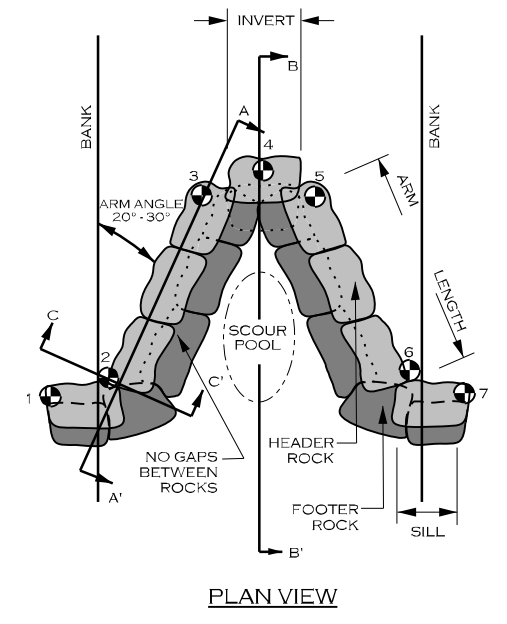
DETAILS

⊙ - ELEVATION POINT (SEE STRUCTURE TABLES)

ROCK CROSS VANE SPECIFICATIONS		
MATERIALS:	SPECIFICATIONS:	
BOULDER	TYPE: GRANITE OR COMPARABLE SIZE: 3 x 2 x 2 FT NUMBER OF HEADER ROWS: 1 NUMBER OF FOOTER ROWS: 1	
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM	
STONE BACKFILL	CLASS A AND 57 STONE (50/50 MIX)	

**NOTES FOR CROSS VANE STRUCTURES:**

- STRUCTURE DIMENSIONS AND MEASUREMENTS ARE SHOWN ON THE STRUCTURE TABLES.
- DIG A TRENCH BELOW THE STREAM BED FOR FOOTER AND HEADER ROCKS, FILTER FABRIC AND STONE BACKFILL.
- PLACE FOOTER ROCKS AND THEN HEADER ROCKS TO ACHIEVE DESIGN DIMENSIONS AND ELEVATIONS.
- USE HAND PLACED STONE TO FILL GAPS AND VOIDS ON UPSTREAM SIDE OF THE HEADER AND FOOTER ROCKS.
- PLACE FILTER FABRIC BEGINNING AT THE TOP OF THE FOOTER ROCKS AND EXTENDING DOWN TO THE DEPTH OF THE FOOTER ROCKS, THEN OUTWARD THE DISTANCE SPECIFIED ABOVE (FILTER FABRIC WIDTH UPSTREAM).
- INSTALL STONE BACKFILL OVER FILTER FABRIC AS SHOWN.
- AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ONSITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.

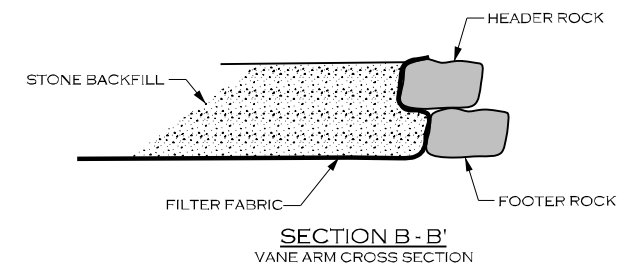
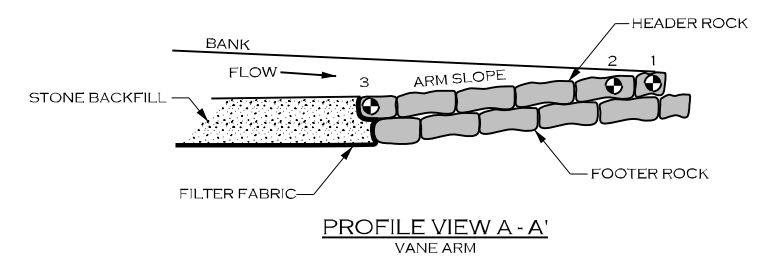
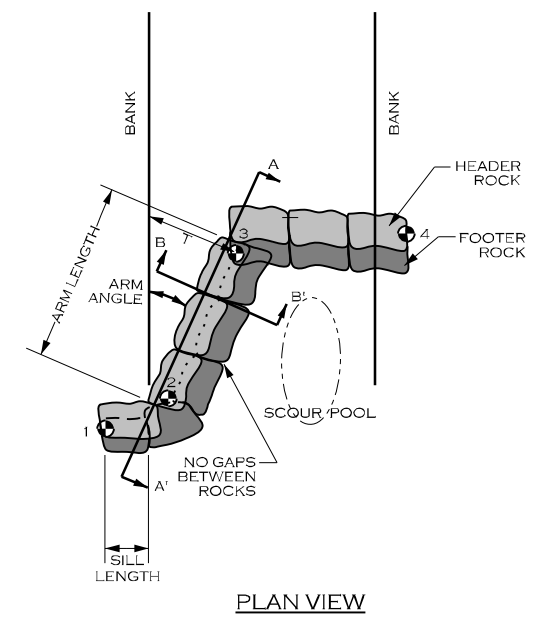


GRADE CONTROL J-HOOK VANE (RJH)

GRADE CONTROL J-HOOK VANE SPECIFICATIONS		
MATERIALS:	SPECIFICATIONS:	
BOULDER	TYPE: GRANITE OR COMPARABLE SIZE: 3 x 2 x 2 FT NUMBER OF HEADER ROWS: 1 NUMBER OF FOOTER ROWS: 1	
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM	
STONE BACKFILL	CLASS A AND 57 STONE (50/50 MIX)	

**NOTES FOR GRADE CONTROL J-HOOK VANE:**

- STRUCTURE DIMENSIONS AND MEASUREMENTS ARE SHOWN ON THE STRUCTURES TABLE SHEET.
- INSTALL FILTER FABRIC BEGINNING AT THE TOP OF THE HEADER ROCKS AND EXTEND DOWNWARD TO THE DEPTH OF THE BOTTOM FOOTER ROCK, AND THEN UPSTREAM TO A MINIMUM OF TEN FEET.
- DIG A TRENCH BELOW THE BED FOR FOOTER ROCKS AND PLACE FILL ON UPSTREAM SIDE OF VANE ARM, BETWEEN THE ARM AND STREAMBANK.
- START AT BANK AND PLACE FOOTER ROCKS FIRST AND THEN HEADER (TOP) ROCK.
- USE HAND PLACED STONE TO FILL GAPS ON UPSTREAM SIDE OF HEADER AND FOOTER ROCKS.
- INSTALL STONE BACKFILL AS SHOWN, TO THE DIMENSIONS INDICATED IN THE STRUCTURES TABLE SHEET.
- AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ONSITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.



⊙ - ELEVATION POINT (SEE STRUCTURES TABLE)

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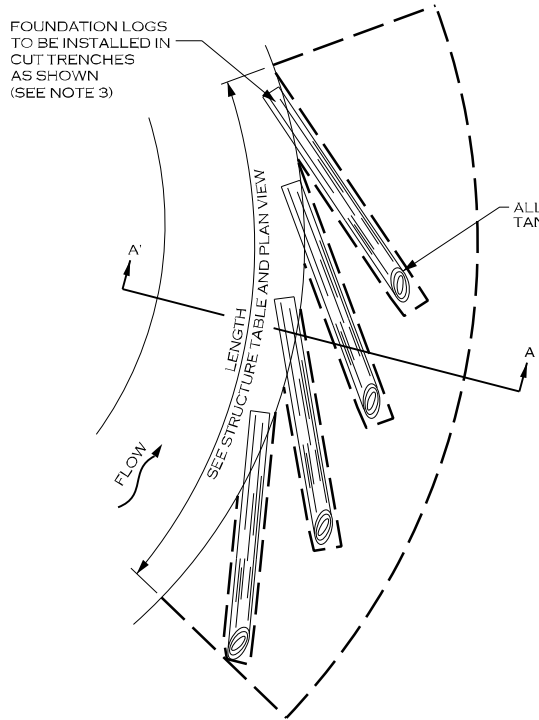
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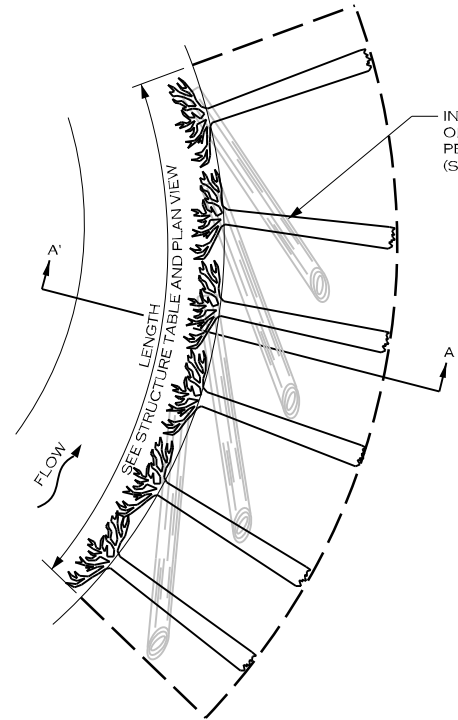
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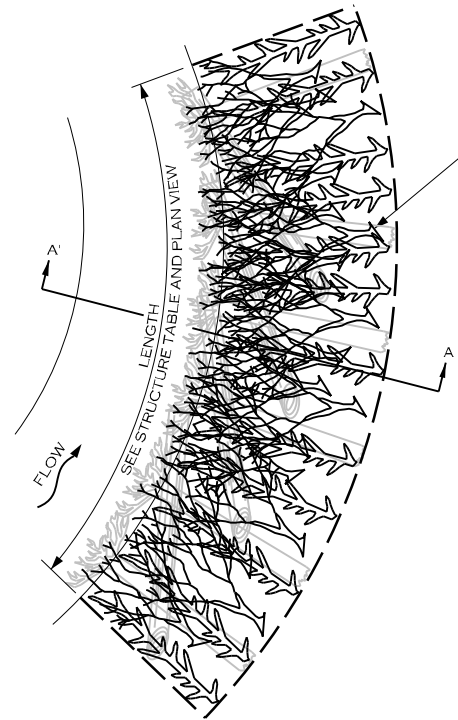




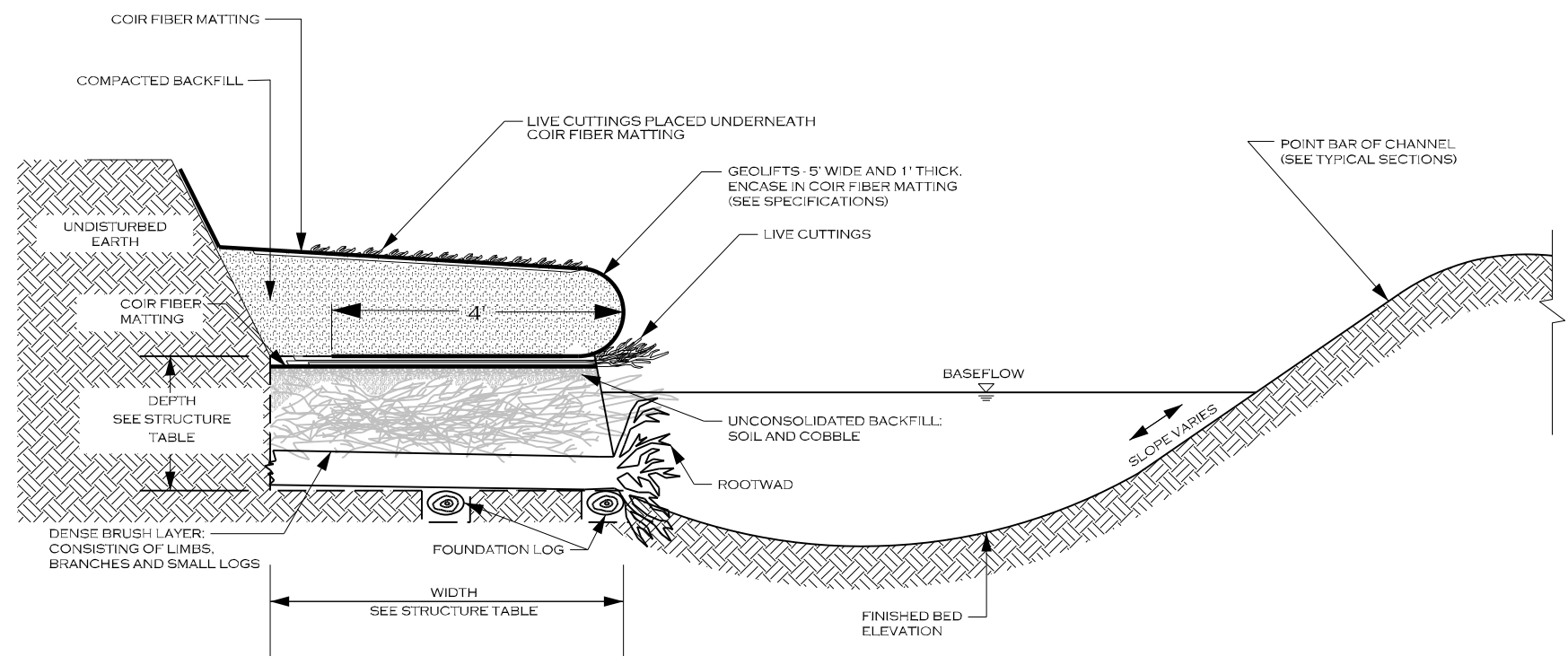
PLAN VIEW - 1  
FOUNDATION LOG INSTALLATION



PLAN VIEW - 2  
ROOTWAD INSTALLATION



PLAN VIEW - 3  
BRUSH LAYER INSTALLATION



SECTION VIEW

TOE WOOD SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
BRUSH MATERIAL	TYPE: BRUSH MATERIAL SIZE: 5 FT LONG, 1 INCH DIAMETER
ROOTWAD MATERIAL	TYPE: HARDWOOD SIZE: 6 FT - 10 FT LONG MIN, 12 INCH DIAMETER
FOUNDATION LOGS	TYPE: HARDWOOD SIZE: 6 FT - 10 FT LONG MIN, 12 INCH DIAMETER
COIR FIBER MATTING	TYPE: NETTING (SEE SPECIFICATIONS)

- NOTES FOR TOE WOOD STRUCTURES:**
- DIG A TRENCH ALONG BANK WHERE TOE WOOD IS TO BE INSTALLED, TO THE DEPTH AND WIDTH SPECIFIED IN THE DETAILS AND STRUCTURE TABLE. IF TOE WOOD IS BEING PLACED IN A LOCATION WHERE THERE IS NOT EXISTING GROUND, PLACE FILL MATERIAL AND COMPACT TO FORM THE TRENCH FOR THE TOE WOOD MATERIALS.
  - FOUNDATION LOGS SHALL MEET THE MINIMUM DIAMETER LISTED ABOVE, AND BE STRAIGHT, HARDWOOD, AND NOT ROTTEN. EXCAVATE TRENCH BELOW TOEWOOD GRADE FOR FOUNDATION LOG INSTALLATION. PLACE FOUNDATION LOGS AS SHOWN IN THE PLAN VIEW 1 TO FORM A FOUNDATION FOR THE TOE WOOD MATERIALS TO LAY UPON. THE ANGLE BETWEEN THE TANGENT LINE OF THE BANK AND THE UPSTREAM FACE OF THE FOUNDATION LOG SHALL BE BETWEEN 20 TO 30 DEGREES.
  - INSTALL ROOTWADS ON TOP OF FOUNDATION LOGS, PERPENDICULAR TO THE FLOW AS SHOWN IN PLAN VIEW 2.
  - INSTALL BRUSH MATERIAL, INCLUDING BRANCHES, LOGS, AND BRUSH, AND AT LEAST 1" IN DIAMETER. LARGE MATERIALS AND SMALL MATERIALS SHALL BE MIXED, PLACED IN LAYERS NO MORE THAN 1 FOOT DEEP, COVERED IN A THIN LAYER OF ONSITE ALLUVIUM, AND COMPACTED BEFORE PLACING THE NEXT LAYER OF TOE WOOD MATERIAL. CONTINUE PLACING MATERIALS TO FORM A DENSE LAYER OF WOODY MATERIALS AND ONSITE ALLUVIUM TO THE DEPTH AND ELEVATIONS SPECIFIED (PLAN VIEW 3).
  - PLACE AN UNCONSOLIDATED LAYER OF SOIL AND COBBLE ON TOP OF BRUSH LAYER.
  - COVER SOIL AND COBBLE LAYER IN COIR FIBER MATTING.
  - INSTALL LIVE CUTTINGS, INCLUDING BRANCHES AND BRUSH, AT LEAST 5 FEET IN LENGTH, AND AT LEAST 1 INCH IN DIAMETER.
  - CONSTRUCT GEOLIFTS OR PLACE TRANSPLANTS (AS SPECIFIED OR DIRECTED BY THE ENGINEER) TO REBUILD THE STREAMBANK ABOVE THE TOE WOOD LAYER.

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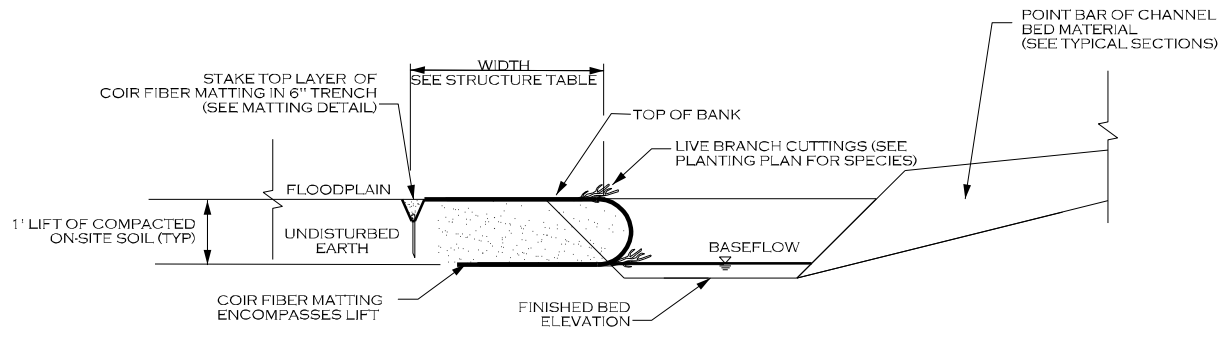
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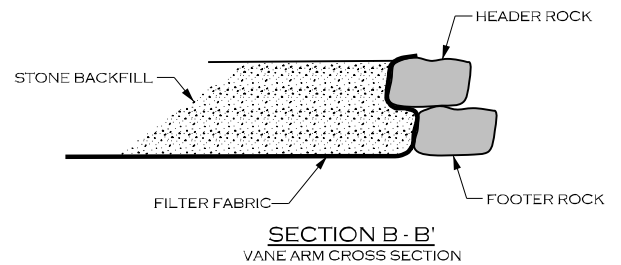
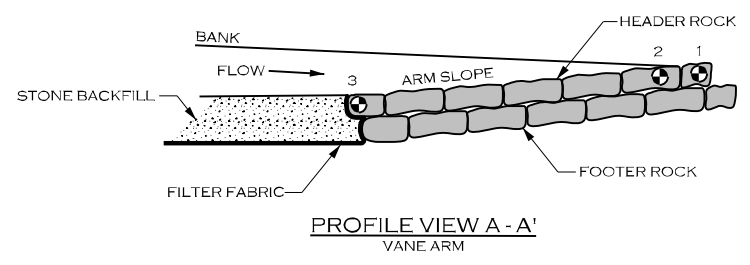
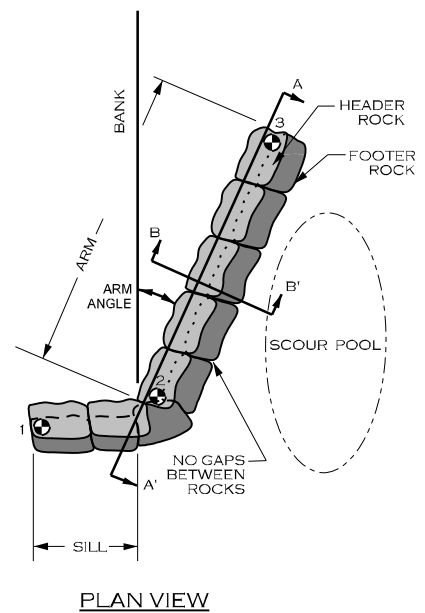
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ROCK VANE (RV)



ROCK VANE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
BOULDER	TYPE: GRANITE OR COMPARABLE SIZE: 3 FT X 2 FT X 2 FT NUMBER OF HEADER ROWS: 1 NUMBER OF FOOTER ROWS: 1
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
<b>NOTES FOR ROCK VANE STRUCTURES:</b>	
1. STRUCTURE DIMENSIONS AND MEASUREMENTS ARE SHOWN ON THE STRUCTURES TABLE SHEET.	
2. DIG A TRENCH BELOW THE STREAM BED FOR FOOTER AND HEADER ROCKS, FILTER FABRIC AND STONE BACKFILL.	
3. PLACE FOOTER ROCKS AND THEN HEADER ROCKS TO ACHIEVE DESIGN DIMENSIONS AND ELEVATIONS.	
4. USE HAND PLACED STONE TO FILL GAPS AND VOIDS ON UPSTREAM SIDE OF THE HEADER AND FOOTER ROCKS.	
5. PLACE FILTER FABRIC BEGINNING AT THE TOP OF THE HEADER ROCKS AND EXTENDING DOWN TO THE DEPTH OF THE FOOTER ROCKS, THEN OUTWARD THE DISTANCE SPECIFIED IN THE STRUCTURES TABLE SHEET.	
6. INSTALL STONE BACKFILL AND ONSITE ALLUVIUM AS SHOWN, TO THE DIMENSIONS INDICATED IN THE STRUCTURES TABLE SHEET.	
7. AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ONSITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.	

• ELEVATION POINT (SEE STRUCTURES TABLE)

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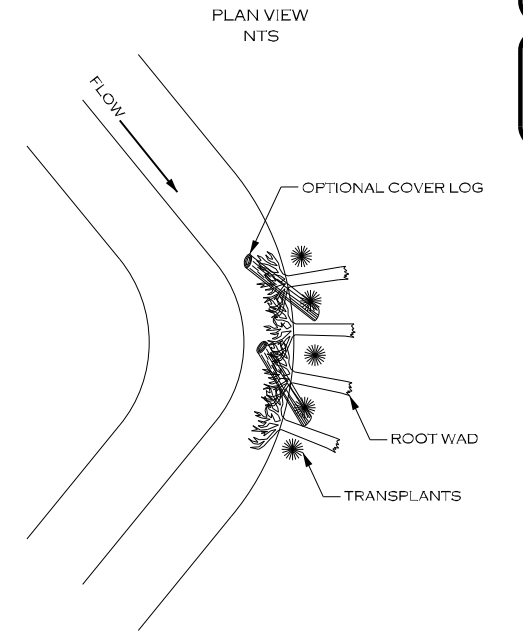
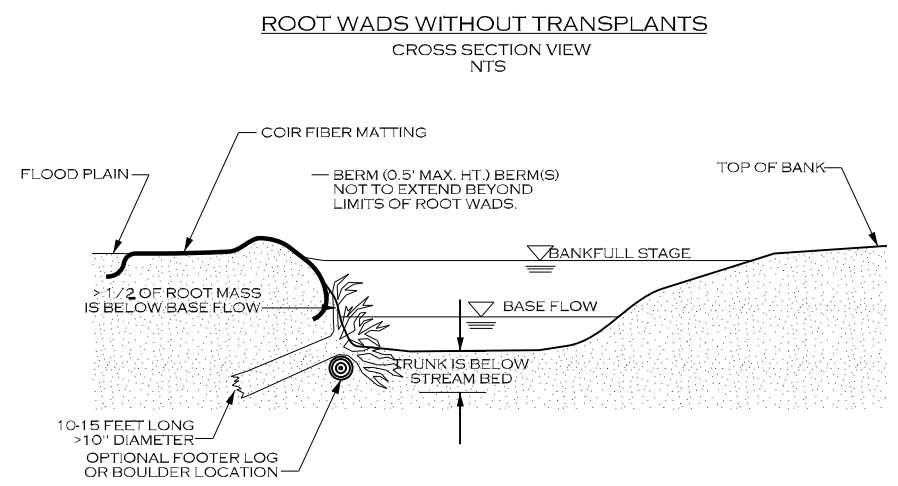
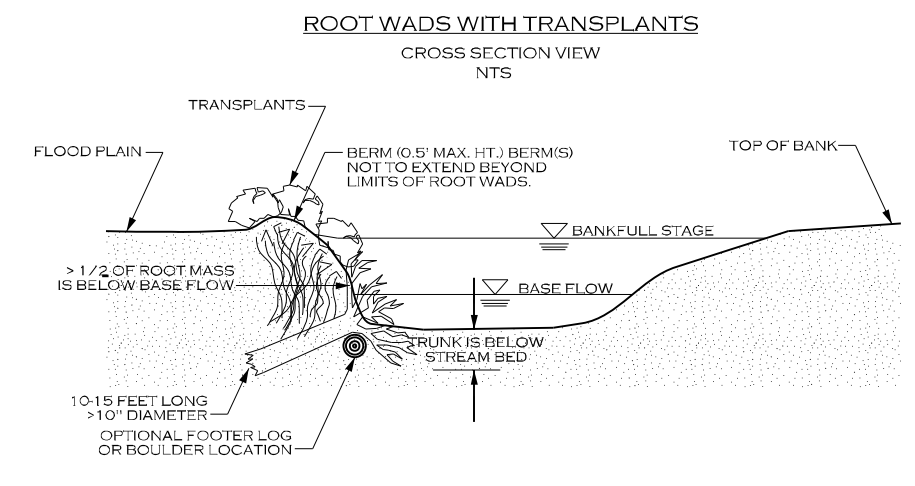
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DETAILS

ROOTWAD (RW)



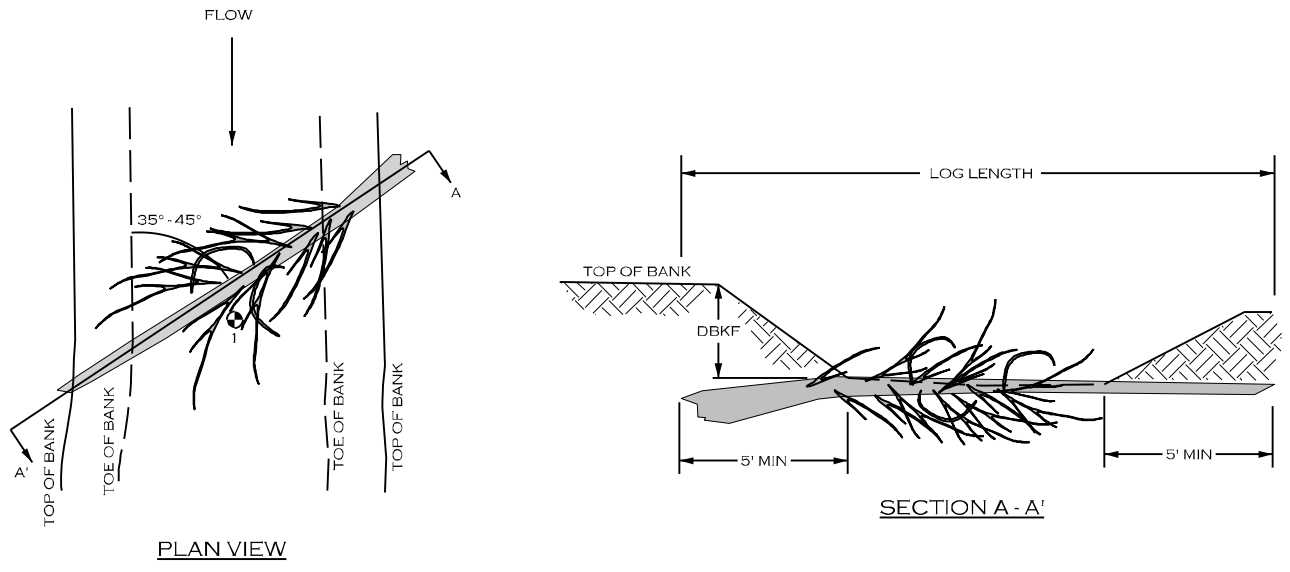
NOTES:

TRENCHING METHOD:  
IF THE ROOT WAD CANNOT BE DRIVEN INTO THE BANK OR THE BANK NEEDS TO BE RECONSTRUCTED, THE TRENCHING METHOD SHOULD BE USED. THIS METHOD REQUIRES THAT A TRENCH BE EXCAVATED FOR THE LOG PORTION OF THE ROOT WAD. IN THIS CASE, A FOOTER LOG SHOULD BE INSTALLED UNDERNEATH THE ROOT WAD IN A TRENCH EXCAVATED PARALLEL TO THE BANK AND WELL BELOW THE STREAMBED. ONE-THIRD OF THE ROOT WAD SHOULD REMAIN BELOW NORMAL BASE FLOW CONDITIONS.

NOTES:

DRIVE POINT METHOD:  
SHARPEN THE END OF THE LOG WITH A CHAINSAW BEFORE "DRIVING" IT INTO THE BANK. ORIENT ROOT WADS AS SHOWN, DEFLECTING THE WATER AWAY FROM THE BANK. A TRANSPLANT SHOULD BE PLACED ON THE DOWNSTREAM SIDE OF THE ROOT WAD IF A BACK EDDY IS FORMED BY THE ROOT WAD.

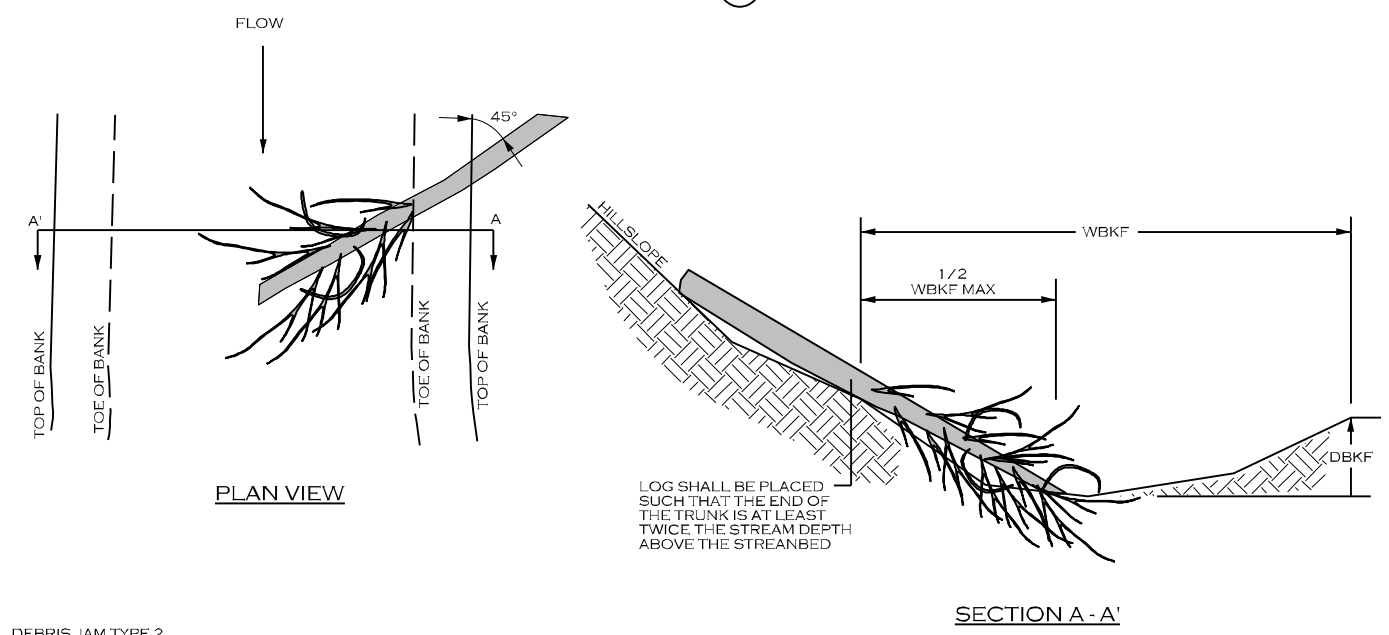
DEBRIS JAM TYPE 1 (DJ T-1)



DEBRIS JAM TYPE 1

1. DEBRIS JAM TYPE 1 INSTALLATIONS SHALL BE PLACED WITHIN STREAM RIFFLES TO TRAP DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH FLOWING, AERATED WATER.
2. TREE SHALL BE ANY NON-EVERGREEN TREE WITH BRANCHES, AT LEAST 8 INCHES DIAMETER, AND NOT ROTTEN.
3. TREE SHALL HAVE CONSIDERABLE NUMBER OF BRANCHES THAT REMAIN EXPOSED AFTER INSTALLATION AND IN CONTACT WITH THE STREAM FLOW TO TRAP LEAVES AND DETRITUS FROM STREAM FLOW.
4. TREE SHALL BE INSTALLED SO THAT THE TRUNK IS LEVEL WITH THE BED ELEVATION OF THE STREAM, SUCH THAT THE TRUNK DOES NOT POOL WATER IN FRONT OF THE STRUCTURE. BACKFILL AND COMPACT AROUND THE TRUNK AND INSTALLED TREE TO MINIMIZE VOIDS.

DEBRIS JAM TYPE 2 (DJ T-2)



DEBRIS JAM TYPE 2

1. DEBRIS JAM TYPE 2 INSTALLATIONS SHALL BE PLACED AREAS WHERE THE STREAM FLOWS AGAINST A STEEP SLOPE. A TREE IS INSTALLED AS SHOWN TO CATCH DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH STREAM FLOWS. THIS DEBRIS JAM MAY BE INSTALLED IN RIFFLE OR POOL LOCATIONS.
2. TREE SHALL BE ANY NON-EVERGREEN TREE WITH BRANCHES, AT LEAST 8 INCHES DIAMETER, AND NOT ROTTEN.
3. TREE SHALL HAVE CONSIDERABLE NUMBER OF BRANCHES THAT REMAIN EXPOSED AND IN CONTACT WITH THE STREAM FLOW AFTER INSTALLATION TO TRAP LEAVES AND DETRITUS FROM STREAM FLOW.
4. TREE SHALL BE INSTALLED SO THAT THE TRUNK LIES UPON THE HILL SLOPE, AND IS ANCHORED TO THE HILLSLOPE TO PREVENT MOVEMENT DURING LARGE STREAM FLOWS. TREE SHALL BE CABLED TO A FRESHLY CUT STUMP OR ANOTHER LIVE TREE OF AT LEAST THE SAME SIZE.

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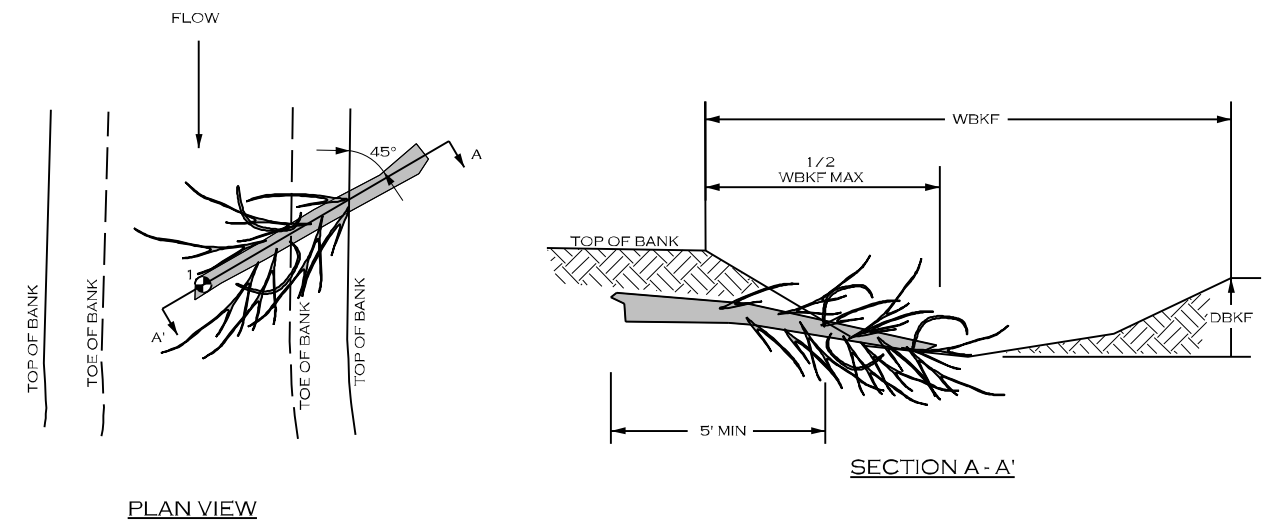
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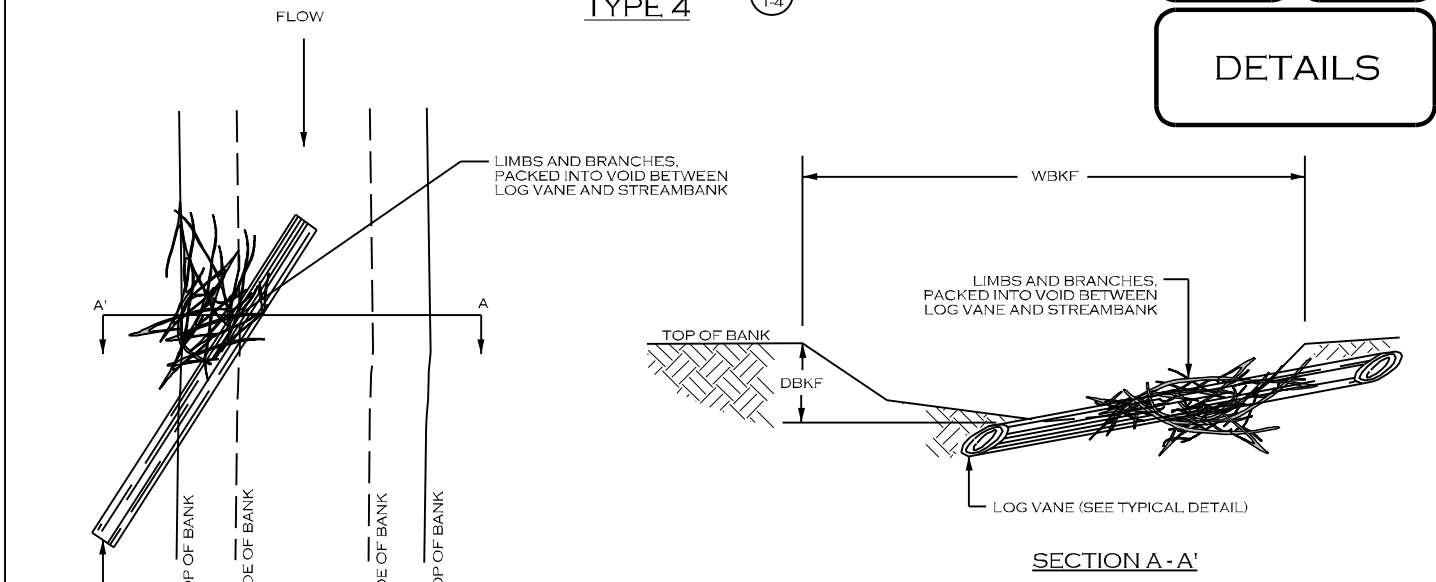
DEBRIS JAM TYPE 3 (DJ T-3)



DEBRIS JAM TYPE 3

1. DEBRIS JAM TYPE 3 INSTALLATIONS SHALL BE PLACED WITHIN STREAM RIFFLES OR POOLS TO TRAP DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH FLOWING WATER.
2. TREE SHALL BE ANY NON-EVERGREEN TREE WITH BRANCHES, AT LEAST 8 INCHES DIAMETER, AND NOT ROTTEN.
3. TREE SHALL HAVE CONSIDERABLE NUMBER OF BRANCHES THAT REMAIN EXPOSED AFTER INSTALLATION AND IN CONTACT WITH THE STREAM FLOW TO TRAP LEAVES AND DETRITUS FROM STREAM FLOW.
4. TREE SHALL BE INSTALLED SO THAT THE TRUNK IS IN CONTACT WITH THE STREAM BED, BACKFILL AND COMPACT AROUND THE TRUNK AND INSTALLED TREE TO MINIMIZE VOIDS.

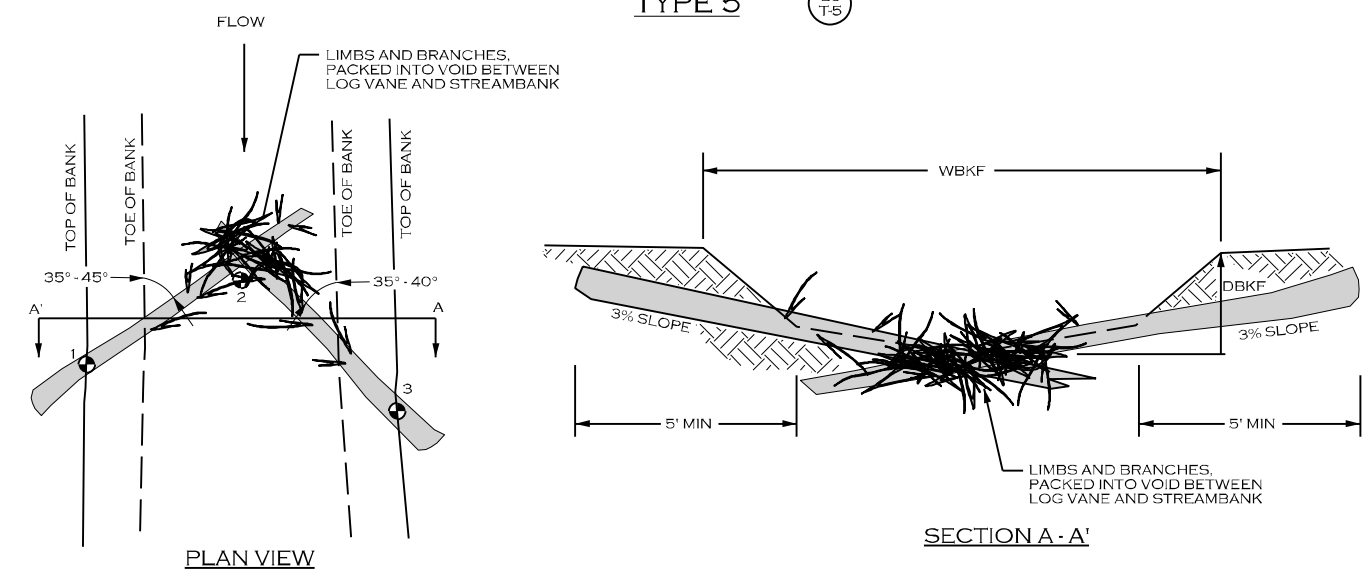
DEBRIS JAM TYPE 4 (DJ T-4)



DEBRIS JAM TYPE 4

1. DEBRIS JAM TYPE 4 INSTALLATIONS SHALL BE INSTALLED IN ASSOCIATION WITH LOG VANE INSTALLATIONS (SEE TYPICAL DETAIL FOR LOG VANE).
2. LIMBS AND BRANCHES THAT FORM THE DEBRIS JAM SHALL VARY IN DIAMETER, BUT SHALL BE AT LEAST 3 FEET LONG WITH MULTIPLE BRANCHES TO PROMOTE ENTANGLING WHEN PACKED TOGETHER. LIMBS AND BRANCHES SHOULD BE A MIXTURE (APPROX. 50/50) OF RECENTLY CUT BRANCHES AND DEAD/DECAYING BRANCHES.
3. PREPARE THE EXCAVATION FOR THE LOG VANE, THEN PLACE THE DEBRIS JAM PRIOR TO PLACING AND INSTALLING THE LOG VANE.
4. WHEN INSTALLED, THE LOG VANE SHOULD PIN THE DEBRIS JAM TO THE STREAM BED AND BANK AND PREVENT EASY MOVEMENT DURING HIGH FLOW EVENTS.
5. AFTER INSTALLATION, STREAM FLOW SHOULD BE IN CONTACT WITH THE DEBRIS JAM, IN ORDER TO TRAP ADDITIONAL DEBRIS AND ORGANIC MATTER.

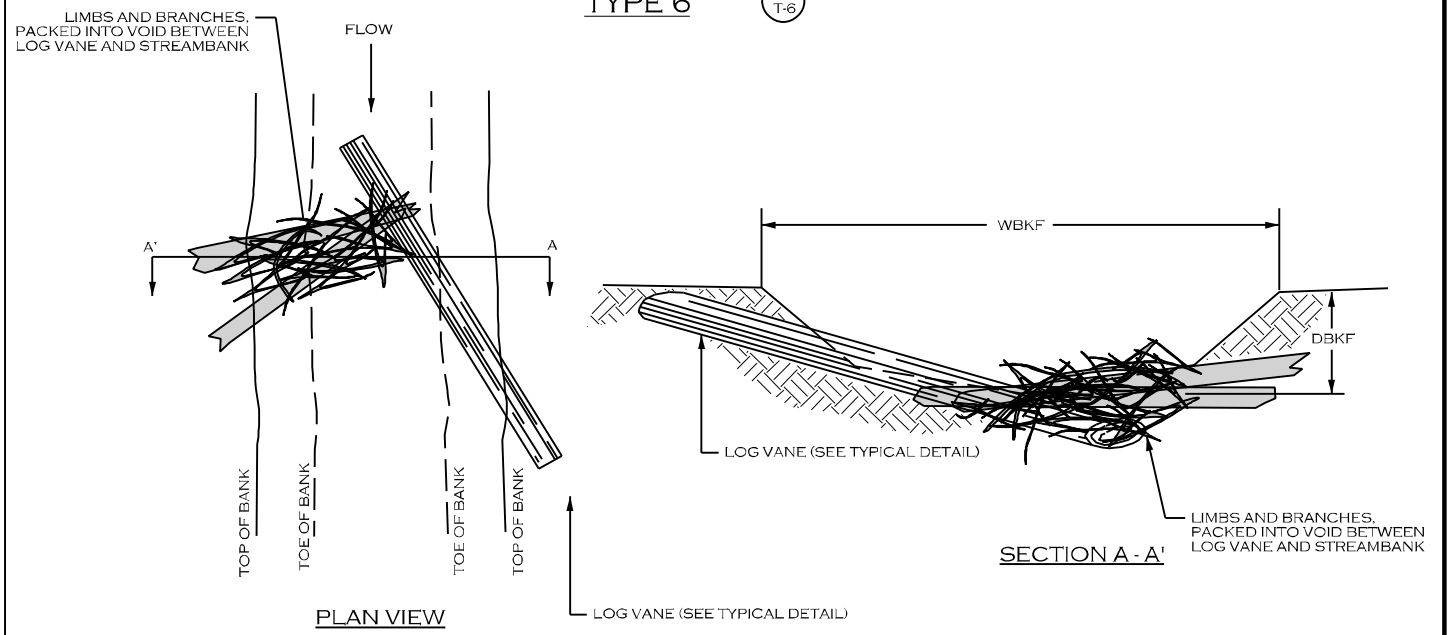
DEBRIS JAM TYPE 5 (DJ T-5)



DEBRIS JAM TYPE 5

1. DEBRIS JAM TYPE 5 INSTALLATIONS SHALL BE PLACED WITHIN STREAM RIFFLES TO TRAP DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH FLOWING, AERATED WATER.
2. LIMBS AND BRANCHES THAT FORM THE DEBRIS JAM SHALL VARY IN DIAMETER, BUT SHALL BE AT LEAST 3 FEET LONG WITH MULTIPLE BRANCHES TO PROMOTE ENTANGLING WHEN PACKED TOGETHER. LIMBS AND BRANCHES SHOULD BE A MIXTURE (APPROX. 50/50) OF RECENTLY CUT BRANCHES AND DEAD/DECAYING BRANCHES.
3. THE INVERT/CENTER OF THE STRUCTURE SHALL BE INSTALLED AT THE STREAM BED ELEVATION, SUCH THAT WATER IS NOT POOLED IN FRONT OF THE STRUCTURE.
4. PREPARE THE EXCAVATION FOR THE TWO LARGER LOGS, THEN PLACE THE DEBRIS JAM PRIOR TO PLACING AND INSTALLING THE TWO LARGER LOGS.
5. WHEN INSTALLED, THE LARGER LOGS SHOULD PIN THE DEBRIS JAM TO THE STREAM BED AND PREVENT EASY MOVEMENT DURING HIGH FLOW EVENTS. SMALL BOULDERS CAN BE USED TO PIN THE LARGER LOGS IN POSITION TO PREVENT MOVEMENT DURING STORM FLOWS.
6. AFTER INSTALLATION, STREAM FLOW SHOULD BE IN CONTACT WITH THE DEBRIS JAM, IN ORDER TO TRAP ADDITIONAL DEBRIS AND ORGANIC MATTER.

DEBRIS JAM TYPE 6 (DJ T-6)



DEBRIS JAM TYPE 6

1. DEBRIS JAM TYPE 6 INSTALLATIONS SHALL BE PLACED IN ASSOCIATION WITH LOG VANES TO TRAP DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH FLOWING, AERATED WATER.
2. LIMBS AND BRANCHES THAT FORM THE DEBRIS JAM SHALL VARY IN DIAMETER, BUT SHALL BE AT LEAST 3 FEET LONG WITH MULTIPLE BRANCHES TO PROMOTE ENTANGLING WHEN PACKED TOGETHER. SMALL LOGS INCORPORATED INTO THE DEBRIS JAM SHALL BE LONG ENOUGH TO BE PINNED INTO PLACE BY THE LOG VANE AND BURIED INTO THE ADJACENT BANK. LIMBS, BRANCHES, AND SMALL LOGS SHOULD BE A MIXTURE (APPROX. 50/50) OF RECENTLY CUT BRANCHES AND DEAD/DECAYING BRANCHES.
3. THE INVERT/CENTER OF THE STRUCTURE SHALL BE INSTALLED AT THE STREAM BED ELEVATION, SUCH THAT WATER IS NOT POOLED IN FRONT OF THE STRUCTURE. AFTER COMPLETION, MOST STREAM FLOW SHOULD FLOW OVER THE LOG VANE AND BE CENTERED NEAR THE MIDDLE OF THE CHANNEL.

Permitted Plans

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SUMTER NATIONAL FOREST  
ENROEE RANGER DISTRICT  
STREAM AND RIPARIAN RESTORATION/  
ENHANCEMENT PROJECT  
LITTLE TURKEY CREEK WATERSHED  
CHESTER COUNTY, SOUTH CAROLINA

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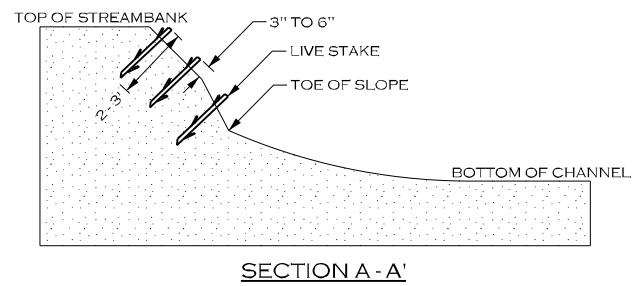
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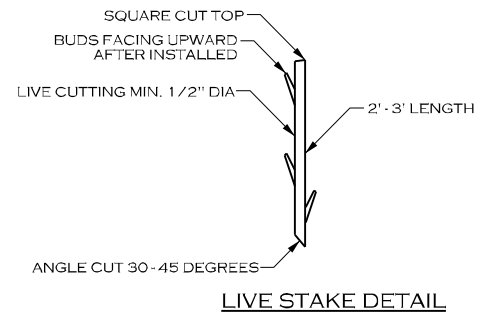
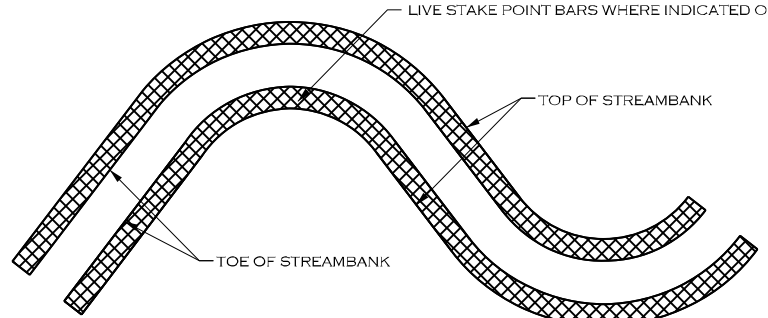
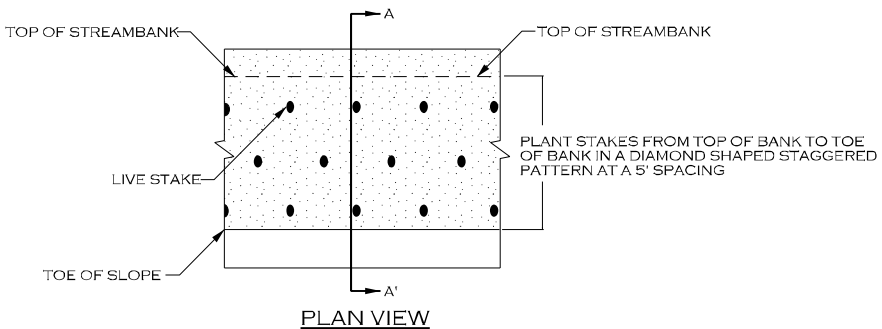
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DETAILS



LIVE STAKING



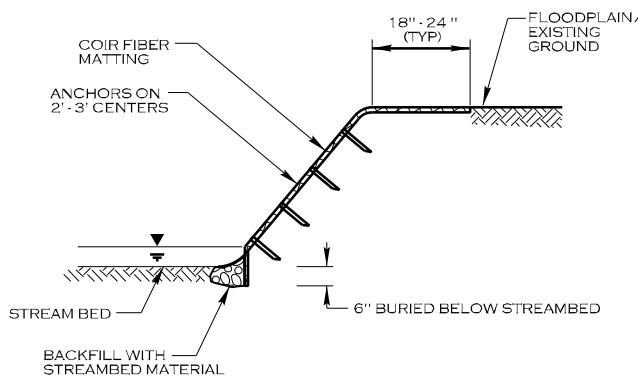
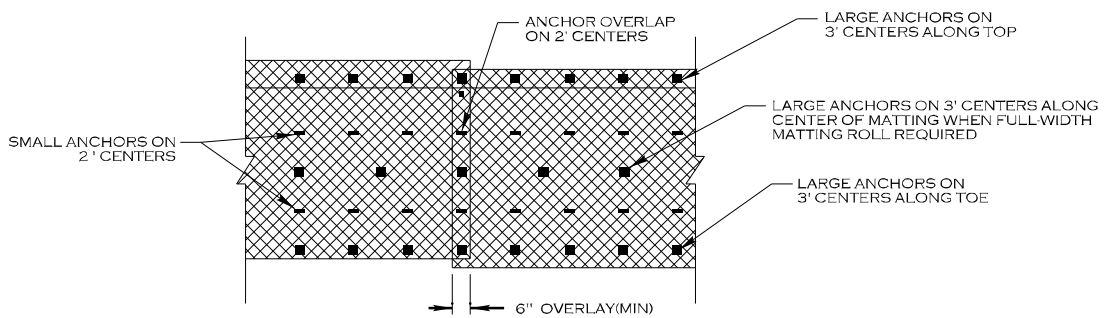
NOTES:

- IF STAKES ARE BEING HARVESTED NEAR THE SITE, STAKES SHOULD BE CUT AND INSTALLED ON THE SAME DAY.
- KEEP STAKES COOL AND MOIST WHILE ON THE JOB SITE AND PRIOR TO INSTALLATION.
- DO NOT INSTALL STAKES THAT HAVE BEEN SPLIT.
- STAKES MUST BE INSTALLED WITH BUDS POINTING UPWARDS.
- STAKES SHALL BE INSTALLED PERPENDICULAR TO BANK.
- STAKES SHALL BE 1/2 TO 2 INCHES IN DIAMETER AND 2 TO 3 FT LONG.
- STAKES SHALL BE INSTALLED LEAVING 1/5 OF STAKE ABOVE GROUND.

SEE PLAN VIEW SHEET FOR LIVE STAKING LOCATIONS

TYPICAL LIVE STAKING AREA PLAN VIEW

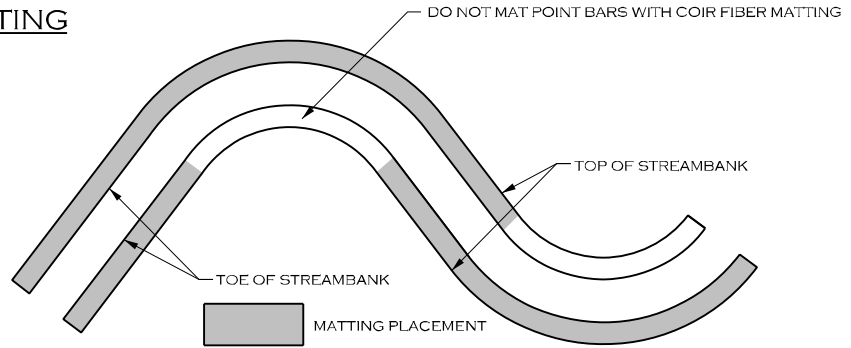
COIR FIBER MATTING



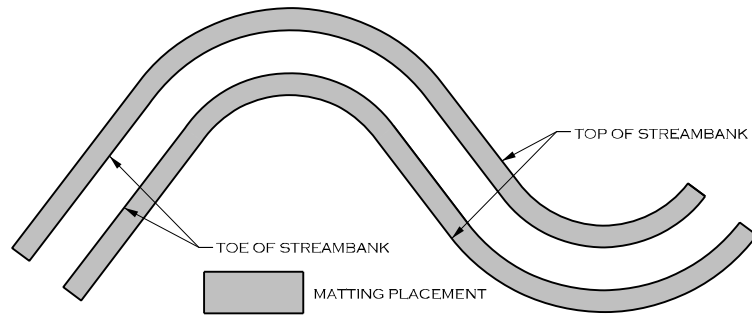
NOTES:

- IN AREAS TO BE MATTED, ALL SEEDING, SOIL AMENDMENTS, AND SOIL PREPARATION MUST BE COMPLETED PRIOR TO PLACEMENT OF COIR FIBER MATTING.
- WOODEN STAKES ARE PREFERRED. USE OF STAPLES AS SMALL ANCHORS MUST BE PRE-APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.

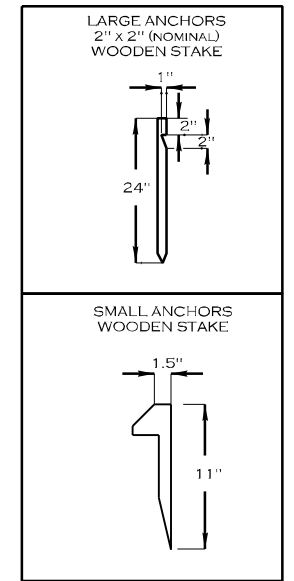
TYPICAL CROSS SECTION



TYPICAL MATTING PLAN VIEW - C STREAMS



TYPICAL MATTING PLAN VIEW - B/STEP POOL STREAMS



ANCHOR OPTIONS

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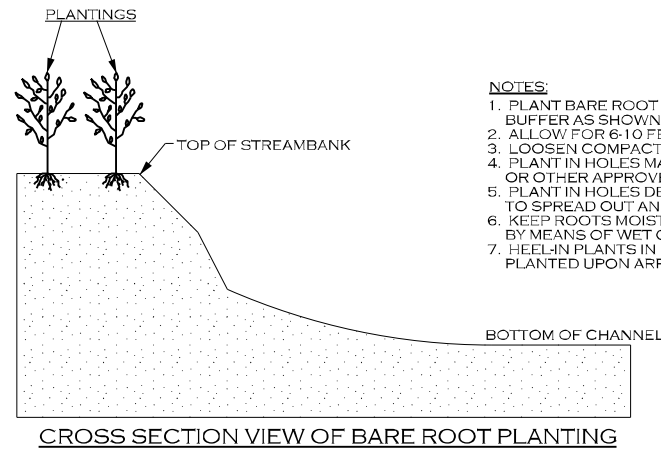
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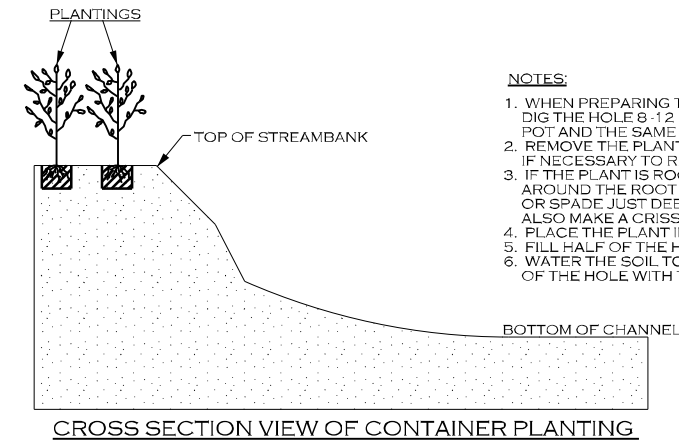
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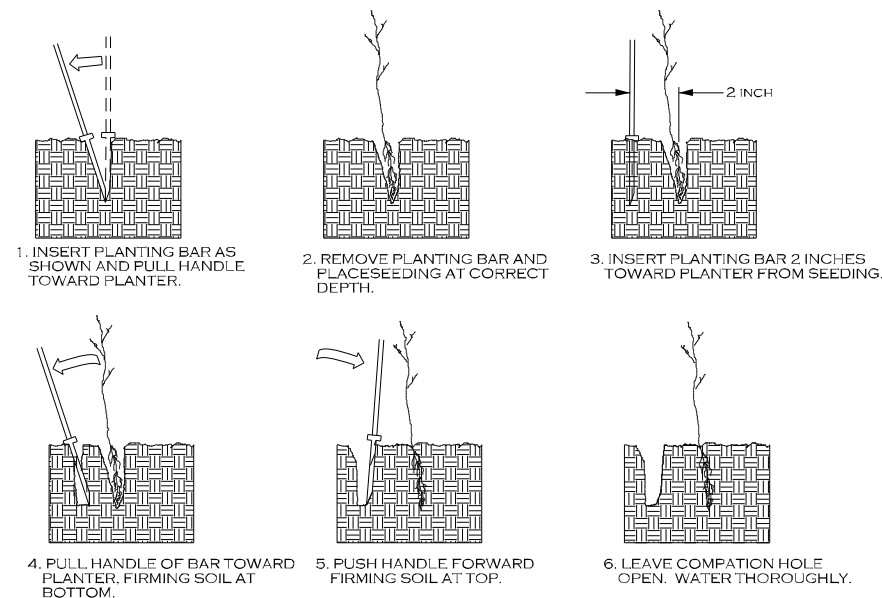
- NOTES:**
1. PLANT BARE ROOT SHRUBS AND TREES TO THE WIDTH OF THE BUFFER AS SHOWN ON THE PLANS.
  2. ALLOW FOR 6-10 FEET BETWEEN PLANTINGS, DEPENDING ON SIZE.
  3. LOOSEN COMPACTED SOIL.
  4. PLANT IN HOLES MADE BY A MATTOCK, DIBBLE, PLANTING BAR, OR OTHER APPROVED MEANS.
  5. PLANT IN HOLES DEEP AND WIDE ENOUGH TO ALLOW THE ROOTS TO SPREAD OUT AND DOWN WITHOUT J-ROOTING.
  6. KEEP ROOTS MOIST WHILE DISTRIBUTING OR WAITING TO PLANT BY MEANS OF WET CANVAS, BURLAP, OR STRAW.
  7. HEEL-IN PLANTS IN MOIST SOIL OR SAWDUST IF NOT PROMPTLY PLANTED UPON ARRIVAL TO PROJECT SITE.



- NOTES:**
1. WHEN PREPARING THE HOLE FOR A POTTED PLANT OR SHRUB DIG THE HOLE 8-12 INCHES LARGER THAN THE DIAMETER OF THE POT AND THE SAME DEPTH AS THE POT.
  2. REMOVE THE PLANT FROM THE POT. LAY THE PLANT ON ITS SIDE IF NECESSARY TO REMOVE THE POT.
  3. IF THE PLANT IS ROOTBOUND (ROOTS GROWING IN A SPIRAL AROUND THE ROOT BALL), MAKE VERTICAL CUTS WITH A KNIFE OR SPADE JUST DEEP ENOUGH TO CUT THE NET OF ROOTS. ALSO MAKE A CRISS-CROSS CUT ACROSS THE BOTTOM OF THE BALL.
  4. PLACE THE PLANT IN THE HOLE.
  5. FILL HALF OF THE HOLE WITH SOIL (SAME SOIL REMOVED FOR BACKFILL).
  6. WATER THE SOIL TO REMOVE AIR POCKETS AND FILL THE REST OF THE HOLE WITH THE REMAINING SOIL.

**Permitted Plans**

**DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR**



**PLANTING NOTES:**

**PLANTING BAG**

DURING PLANTING, SEEDLINGS SHALL BE KEPT IN A MOIST CANVAS BAG OR SIMILAR CONTAINER TO PREVENT THE ROOT SYSTEMS FROM DRYING.

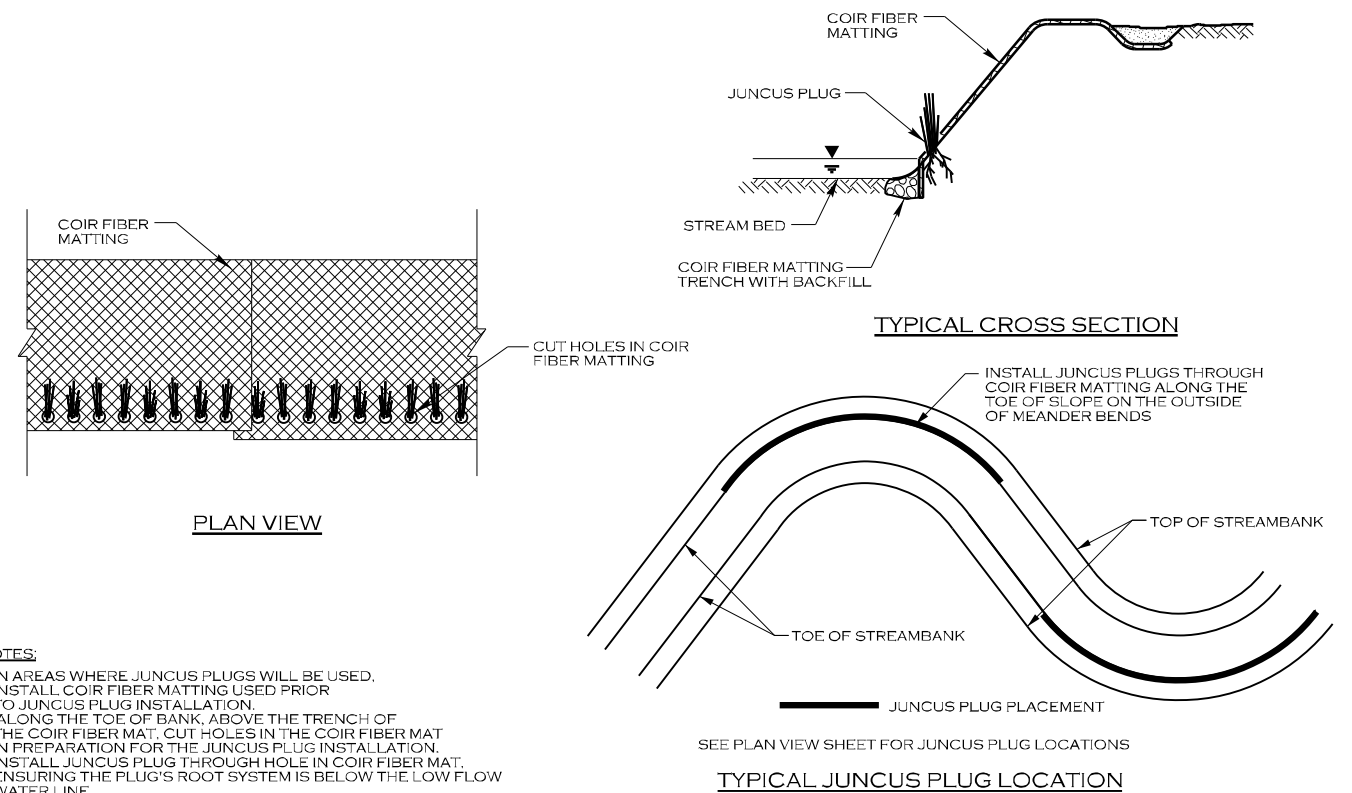
**KBC PLANTING BAR**

PLANTING BAR SHALL HAVE A BLADE WITH A TRIANGULAR CROSS SECTION, AND SHALL BE 12 INCHES LONG, 4 INCHES WIDE AND 1 INCH THICK AT CENTER.

**ROOT PRUNING**

ALL SEEDLINGS SHALL BE ROOT PRUNED, IF NECESSARY, SO THAT NO ROOTS EXTEND MORE THAN 10 INCHES BELOW THE ROOT COLLAR.

**JUNCUS PLUG**



**NOTES:**

1. IN AREAS WHERE JUNCUS PLUGS WILL BE USED, INSTALL COIR FIBER MATTING USED PRIOR TO JUNCUS PLUG INSTALLATION.
2. ALONG THE TOE OF BANK, ABOVE THE TRENCH OF THE COIR FIBER MAT, CUT HOLES IN THE COIR FIBER MAT IN PREPARATION FOR THE JUNCUS PLUG INSTALLATION.
3. INSTALL JUNCUS PLUG THROUGH HOLE IN COIR FIBER MAT, ENSURING THE PLUG'S ROOT SYSTEM IS BELOW THE LOW FLOW WATER LINE.

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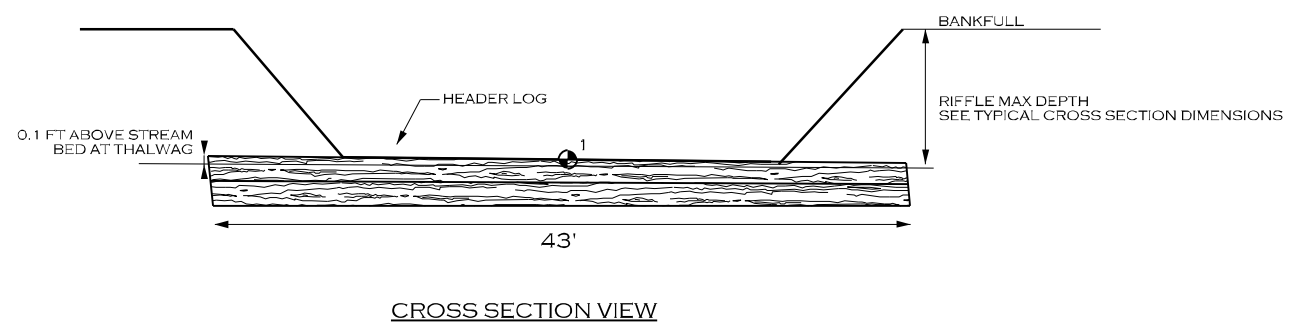
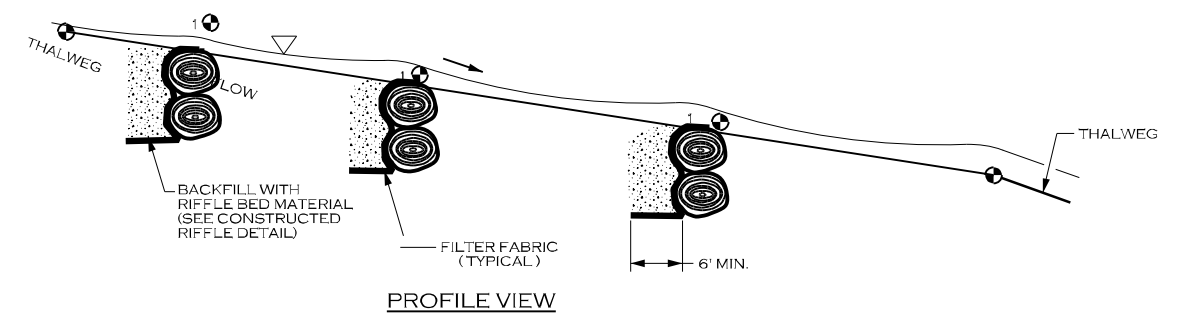
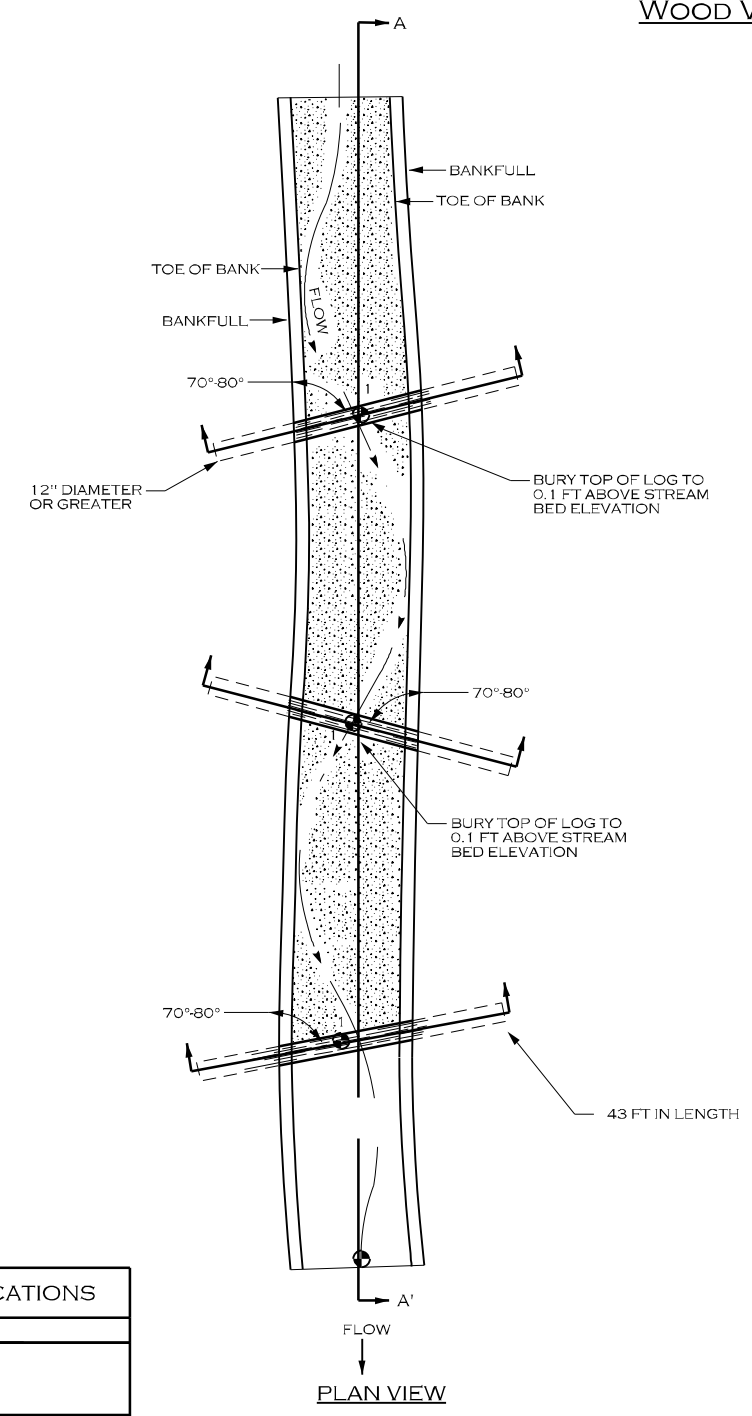
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DETAILS




WOOD VALLEY GRADE CONTROL SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
RIFFLE BED MATERIAL	SEE CONSTRUCTED RIFFLE DETAIL
LOGS	TYPE: HARDWOOD SIZE: LENGTH = 43 FEET, 12\"/>
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
<b>NOTES FOR LOG ROLLER STRUCTURES:</b>	
1. STRUCTURE DIMENSIONS AND MEASUREMENTS ARE SHOWN ON THE STRUCTURE TABLES SHEET. NUMBER OF LOGS MAY VARY.	
2. LOGS SHOULD BE STRAIGHT, HARDWOOD, AND NOT ROTTEN.	
3. SOIL SHOULD BE COMPACTED WELL AROUND BURIED PORTIONS OF LOGS.	
4. FILTER FABRIC SHOULD BE NAILED TO THE LOG BELOW THE STONE BACKFILL.	
5. RIFFLE STATIONS AND ELEVATIONS (1 & 5) ARE SHOWN ON BOTH THE STRUCTURE TABLES FOR WOOD VALLEY GRADE CONTROL AND CONSTRUCTED RIFFLES IF APPLICABLE.	
6. NUMBER OF LOGS MAY VARY.	

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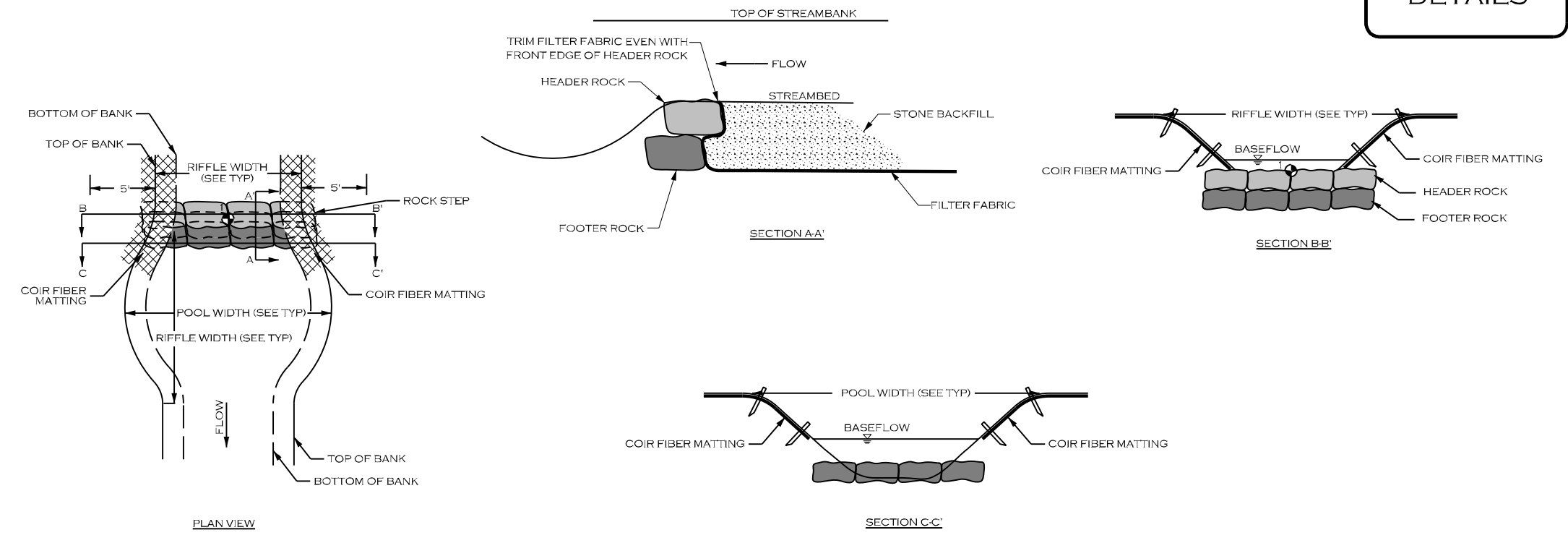
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DETAILS

ROCK STEP (RS)

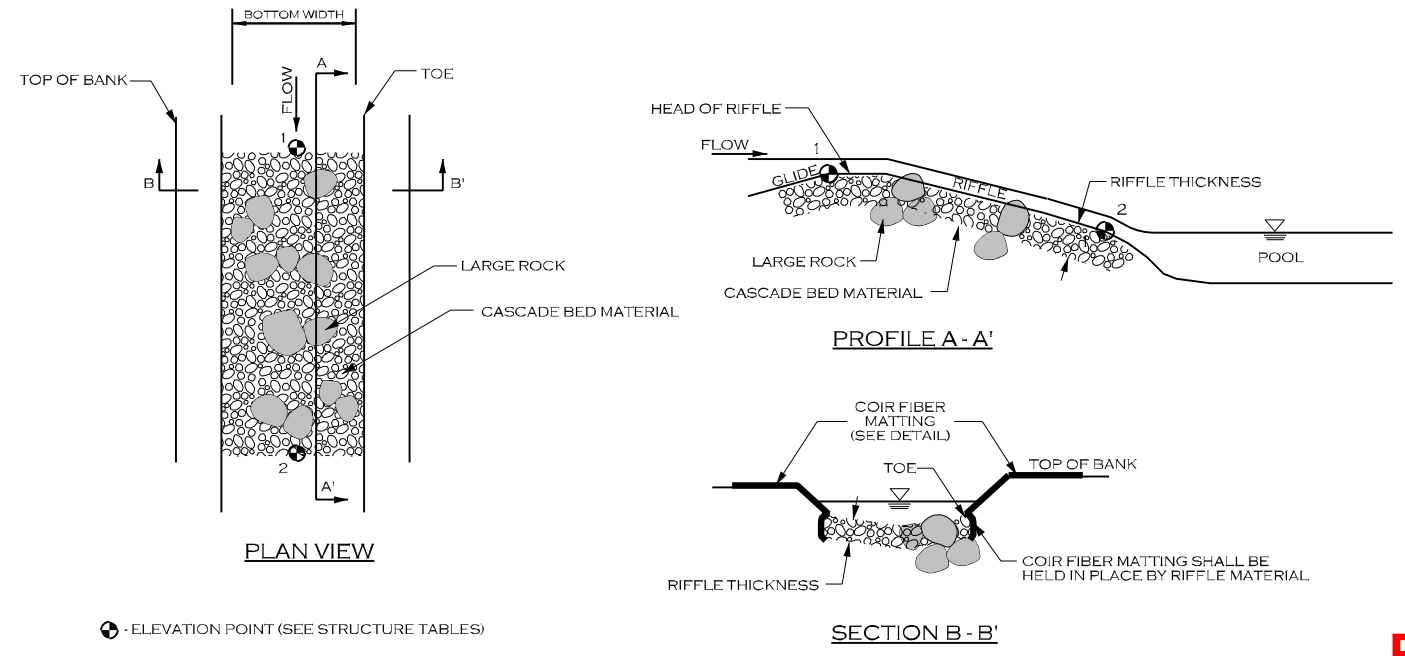
• ELEVATION POINT (SEE STRUCTURE TABLE)

ROCK STEP SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
BOULDER	TYPE: GRANITE OR COMPARABLE SIZE: 3 FT X 2 FT X 2 FT
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
COIR FIBER MATTING	TYPE: SEE DETAIL
<b>NOTES FOR ROCK STEP STRUCTURES:</b>	
<ol style="list-style-type: none"> <li>DIG A TRENCH BELOW THE STREAM BED FOR FOOTER AND HEADER ROCKS, FILTER FABRIC AND STONE BACKFILL.</li> <li>PLACE FOOTER ROCKS AND THEN HEADER ROCKS TO ACHIEVE DESIGN DIMENSIONS AND ELEVATIONS.</li> <li>USE HAND PLACED STONE TO FILL GAPS AND VOIDS ON UPSTREAM SIDE OF THE HEADER AND FOOTER ROCKS.</li> <li>PLACE FILTER FABRIC BEGINNING AT THE TOP OF THE HEADER ROCKS AND EXTENDING DOWN TO THE DEPTH OF THE FOOTER ROCKS, THEN OUTWARD THE DISTANCE SPECIFIED IN THE STRUCTURES TABLE SHEET.</li> <li>INSTALL STONE BACKFILL, AS SHOWN, TO THE DIMENSIONS INDICATED IN THE STRUCTURES TABLE SHEET.</li> <li>AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ONSITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.</li> <li>PLACE TRANSPLANTS FROM TOE OF STREAMBANK TO TOP OF STREAMBANK.</li> <li>TRANSPLANTS CAN BE SUBSTITUTED WITH COIR FIBER MATTING AT THE DIRECTION OF THE ENGINEER.</li> </ol>	



CONSTRUCTED CASCADE (CC)

CONSTRUCTED CASCADE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
LARGE ROCKS	TYPE: GRANITE OR COMPARABLE SIZE: 2 X 1 X 1 FT THICKNESS: 24 INCHES MIN.
CASCADE BED MATERIAL	TYPE: GRANITE OR COMPARABLE SIZE: CLASS A AND CLASS B (50/50 MIX) THICKNESS: 16 INCHES MIN.
COIR FIBER MATTING	SEE DETAIL
<b>NOTES FOR CONSTRUCTED CASCADE STRUCTURES:</b>	
<ol style="list-style-type: none"> <li>GRADE STREAMBED AND BANKS TO PROPOSED DIMENSIONS PER TYPICAL CROSS-SECTION AND PROFILE.</li> <li>EXCAVATE TRENCH BELOW PROPOSED STREAMBED ELEVATION EQUAL TO OR GREATER THAN RIFFLE THICKNESS.</li> <li>PLACE COIR FIBER MATTING ON BANKS AND LAY DOWN INTO TRENCH EXCAVATED FOR RIFFLE BED MATERIAL.</li> <li>FILL TRENCH WITH STONE TO FINAL DESIGN STREAM GRADE.</li> </ol>	



• ELEVATION POINT (SEE STRUCTURE TABLES)

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# VEGETATION SELECTION

## TABLES

### SOUTH-CENTRAL OAK-HARDWOOD & PINE FOREST

PIGNET HICKORY (*CARYA GLABRA*)  
 MOCKERNUT HICKORY (*CARYA TOMENTOSA*)  
 FLOWERING DOGWOOD (*CORNUS FLORIDA*)  
 EASTERN RED CEDAR (*JUNIPERUS VIRGINIANA*)  
 TULIP POPLAR (*LIRIODENDRON TULIPIFERA*)  
 BLACK GUM (*NYSSA SYLVATICA*)

SOURWOOD (*OXYDENDRUM ARBOREUM*)  
 SHORTLEAF PINE (*PINUS ECHINATA*)  
 SOUTHERN RED OAK (*QUERCUS FALCATA*)  
 NORTHERN RED OAK (*QUERCUS RUBRA*)  
 POST OAK (*QUERCUS STELLATA*)  
 BLACK OAK (*QUERCUS VELUTINA*)

### CENTRAL MESOPHYTIC HARDWOOD FOREST

SOUTHERN SUGAR MAPLE (*ACER BARBATUM*)  
 RED MAPLE (*ACER RUBRUM*)  
 SOUTHERN SHAGBARK HICKORY  
 (*CARYA CAROLINAE-SEPTRIONALIS*)  
 PIGNET HICKORY (*CARYA GLABRA*)  
 MOCKERNUT HICKORY (*CARYA TOMENTOSA*)  
 SUGARBERRY (*CELTIS LAEVIGATA*)  
 AMERICAN BEECH (*FAGUS GRANDIFOLIA*)  
 WHITE ASH (*FRAXINUS AMERICANA*)  
 BLACK WALNUT (*JUGLANS NIGRA*)  
 TULIP POPLAR (*LIRIODENDRON TULIPIFERA*)

CUCUMBER MAGNOLIA (*MAGNOLIA ACUMINATA*)  
 BLACK GUM (*NYSSA SYLVATICA*)  
 WHITE OAK (*QUERCUS ALBA*)  
 BLACK OAK (*QUERCUS NIGRA*)  
 NORTHERN RED OAK (*QUERCUS RUBRA*)  
 AMERICAN BASSWOOD (*TILIA AMERICANA*)  
 IRONWOOD (*CARPINUS CAROLINIANA*)  
 REDBUD (*CERCIS CANADENSIS*)  
 FLOWERING DOGWOOD (*CORNUS FLORIDA*)  
 HOP HORNBEAM (*OSTRYA VIRGINIANA*)  
 SOURWOOD (*OXYDENDRUM ARBOREUM*)

### SOUTHERN FLOODPLAIN HARDWOOD FOREST

SOUTHERN SUGAR MAPLE (*ACER BARBATUM*)  
 BOXELDER (*ACER NEGUNDO*)  
 RED MAPLE (*ACER RUBRUM*)  
 RIVER BIRCH (*BETULA NIGRA*)  
 SHAGBARK HICKORY (*CARYA OVATA*)  
 SUGARBERRY (*CELTIS LAEVIGATA*)  
 AMERICAN BEECH (*FAGUS GRANDIFOLIA*)  
 BLACK WALNUT (*JUGLANS NIGRA*)  
 TULIP POPLAR (*LIRIODENDRON TULIPIFERA*)  
 BLACK GUM (*NYSSA SYLVATICA*)  
 AMERICAN SYCAMORE (*PLATANUS OCCIDENTALIS*)  
 WHITE OAK (*QUERCUS ALBA*)  
 SWAMP CHESTNUT OAK (*QUERCUS MICHAUXII*)

WILLOW OAK (*QUERCUS PHELLOS*)  
 NORTHERN RED OAK (*QUERCUS RUBRA*)  
 AMERICAN BASSWOOD (*TILIA AMERICANA*)  
 AMERICAN ELM (*ULMUS AMERICANA*)  
 SWITCH CANE (*ARUNDINARIA TECTA*)  
 BEAUTYBERRY (*CALLICARPA AMERICANA*)  
 IRONWOOD (*CARPINUS CAROLINIANA*)  
 FLOWERING DOGWOOD (*CORNUS FLORIDA*)  
 POSSUMHAW (*ILEX DECIDUA*)  
 EASTERN RED CEDAR (*JUNIPERUS VIRGINIANA*)  
 SPICEBUSH (*LINDERA BENZOIN*)  
 SOURWOOD (*OXYDENDRUM ARBOREUM*)

### EASTERN NORTH AMERICA WET MEADOW AND MARSH

SILKY DOGWOOD (*CORNUS AMOMUM*)  
 BLACK WILLOW (*SALIX NIGRA*)

BUTTONBUSH (*CEPHALANTHUS OCCIDENTALIS*)

### NORTHERN & CENTRAL SWAMP FOREST (STREAMSIDE ASSEMBLAGE)

RED MAPLE (*ACER RUBRUM*)  
 BLACK GUM (*NYSSA SYLVATICA*)  
 WILLOW OAK (*QUERCUS PHELLOS*)  
 TAG ALDER (*ALNUS SERRULATA*)

IRONWOOD (*CARPINUS CAROLINIANA*)  
 SILKY DOGWOOD (*CORNUS AMOMUM*)  
 POSSUMHAW (*ILEX DECIDUA*)  
 ELDERBERRY (*SAMBUCUS CANADENSIS*)

### NOTES:

1. SPECIES LISTED ARE PRELIMINARY AND MAY BE MODIFIED BASED ON AVAILABILITY AT THE TIME OF PLANTING.
2. SPECIES TO BE PLANTED WILL BE CLOSELY COORDINATED WITH THE US FOREST SERVICE STAFF AT SUMTER NATIONAL FOREST, ENOREE RANGE DISTRICT.
3. CLEARING AND REMOVAL OF EXISTING TREES AND VEGETATION WILL BE LIMITED TO THE EXTENT PRACTICABLE.
4. ALL DISTURBED AREAS WILL BE REPLANTED WITH APPROPRIATE HERBACEOUS AND WOODY SPECIES, BASED ON LANDSCAPE POSITION, MOISTURE REGIME, LANDFORM, AND SOILS.
5. THE NORTHERN AND CENTRAL SWAMP FOREST (STREAMSIDE ASSEMBLAGE) CORRESPONDS TO VEGETATED WETLANDS IN SEEPAGES AND SMALL STREAM HEADWATERS.
6. THE SOUTHERN FLOODPLAIN HARDWOOD FOREST IS THE PRIMARY TARGET COMMUNITY FOR FLOODPLAIN AREAS.
7. THE EASTERN NORTH AMERICAN WET MEADOW AND MARSH AREAS CORRESPOND TO LOW LYING AND DEPRESSIONAL (FLOODPLAIN POOL) AREAS.
8. THE CENTRAL MESOPHYTIC HARDWOOD FOREST SPECIES WILL BE PLANTED ALONG TERRACE AND VALLEY SIDE SLOPES.
9. THE SOUTH-CENTRAL OAK-HARDWOOD AND PINE FOREST WILL BE REPLANTED ON ADJACENT UPLAND AND ACCESS AREAS WITHIN THE LIMITS OF DISTURBANCE.

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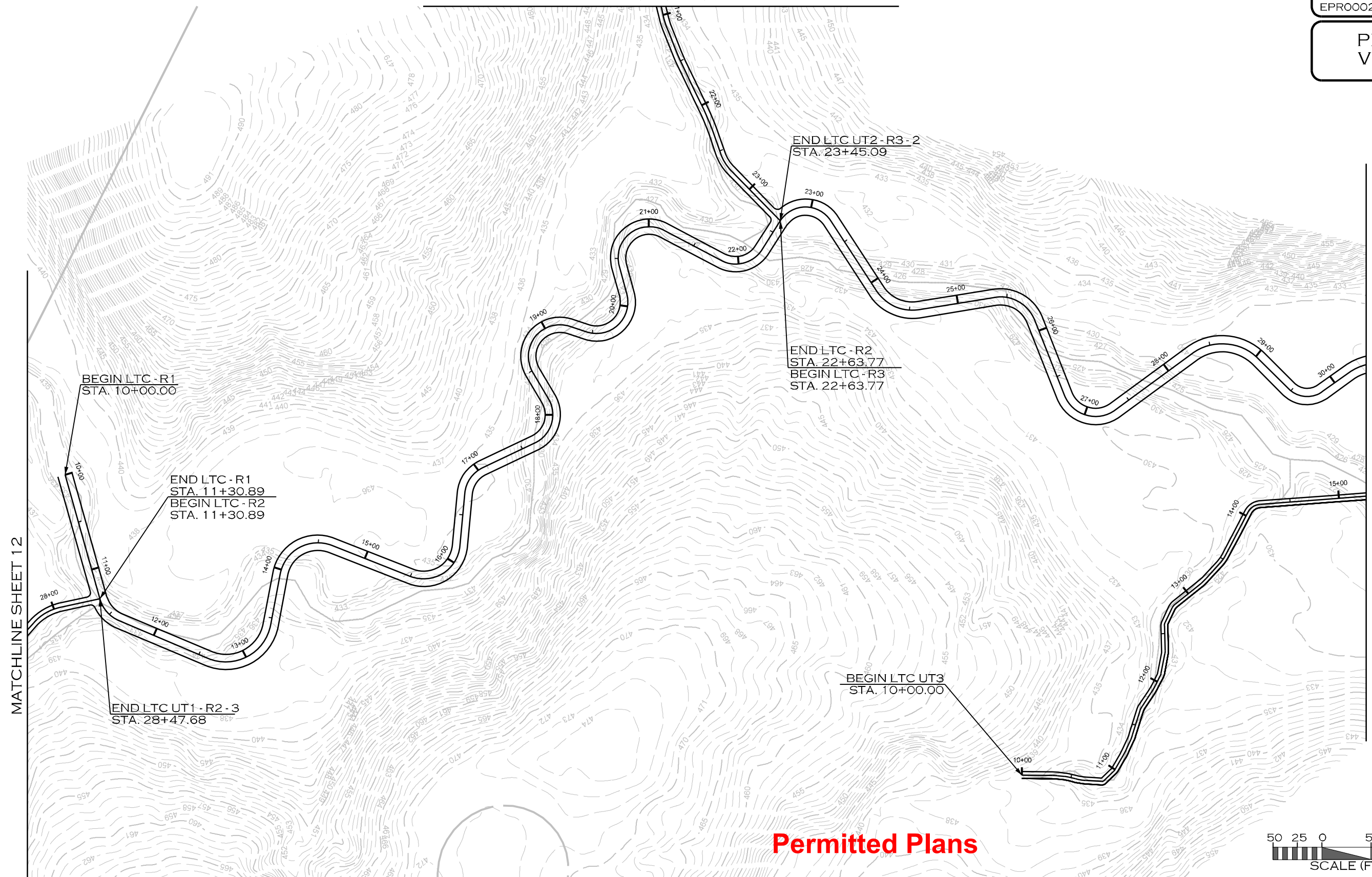
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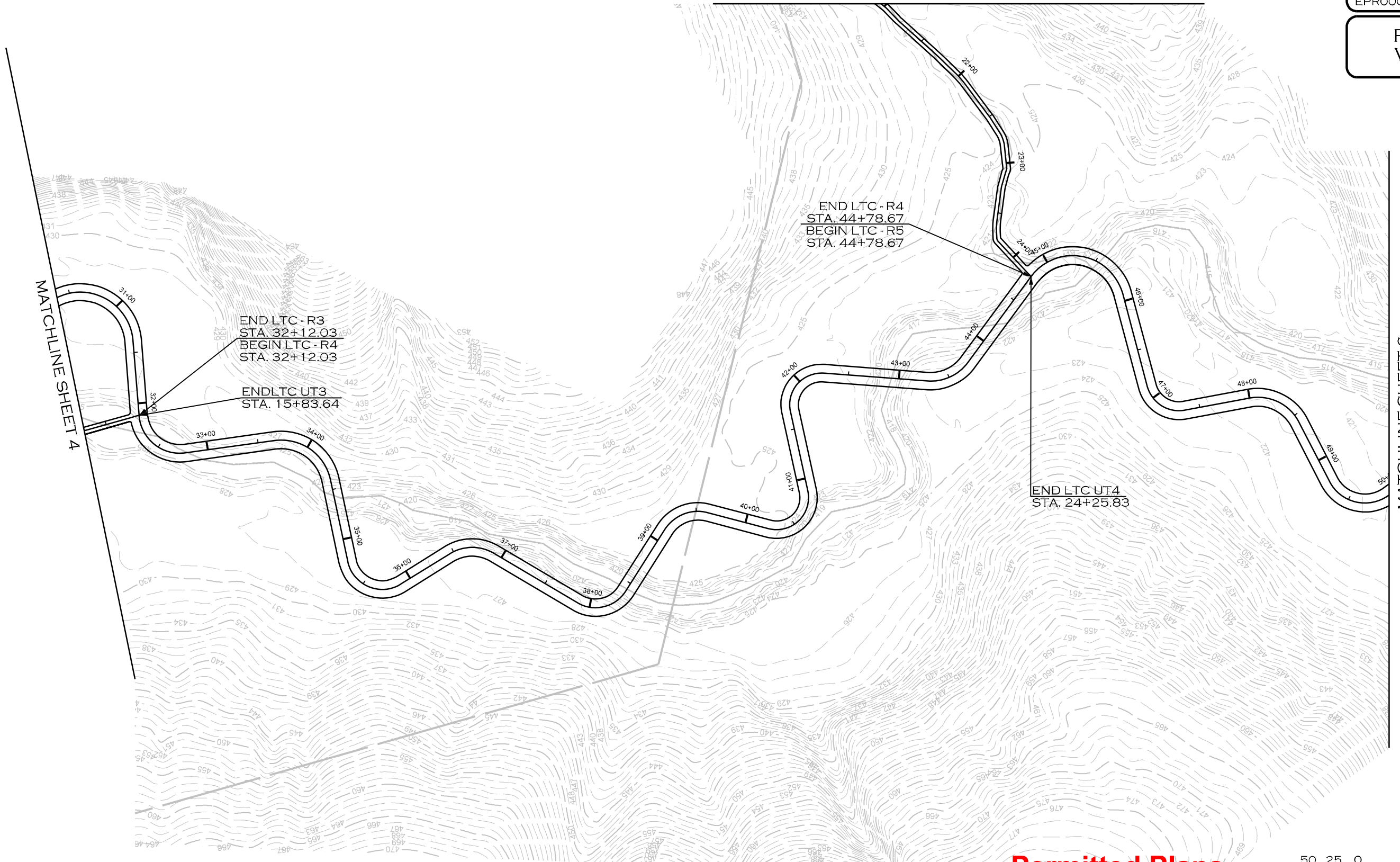
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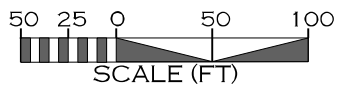
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MKOON

REVISIONS				
NO.	DESCRIPTION	ENGR.	APPROV.	DATE
1	PERMITTING DESIGN PLANS	EB	KLT	10/25/23

PREPARED FOR:



SC DEPARTMENT OF COMMERCE  
FOR SCOUT MOTORS

SUMTER NATIONAL FOREST  
ENROEE RANGER DISTRICT  
STREAM AND RIPARIAN RESTORATION/  
ENHANCEMENT PROJECT  
LITTLE TURKEY CREEK WATERSHED  
CHESTER COUNTY, SOUTH CAROLINA

PREPARED IN THE OFFICE OF:

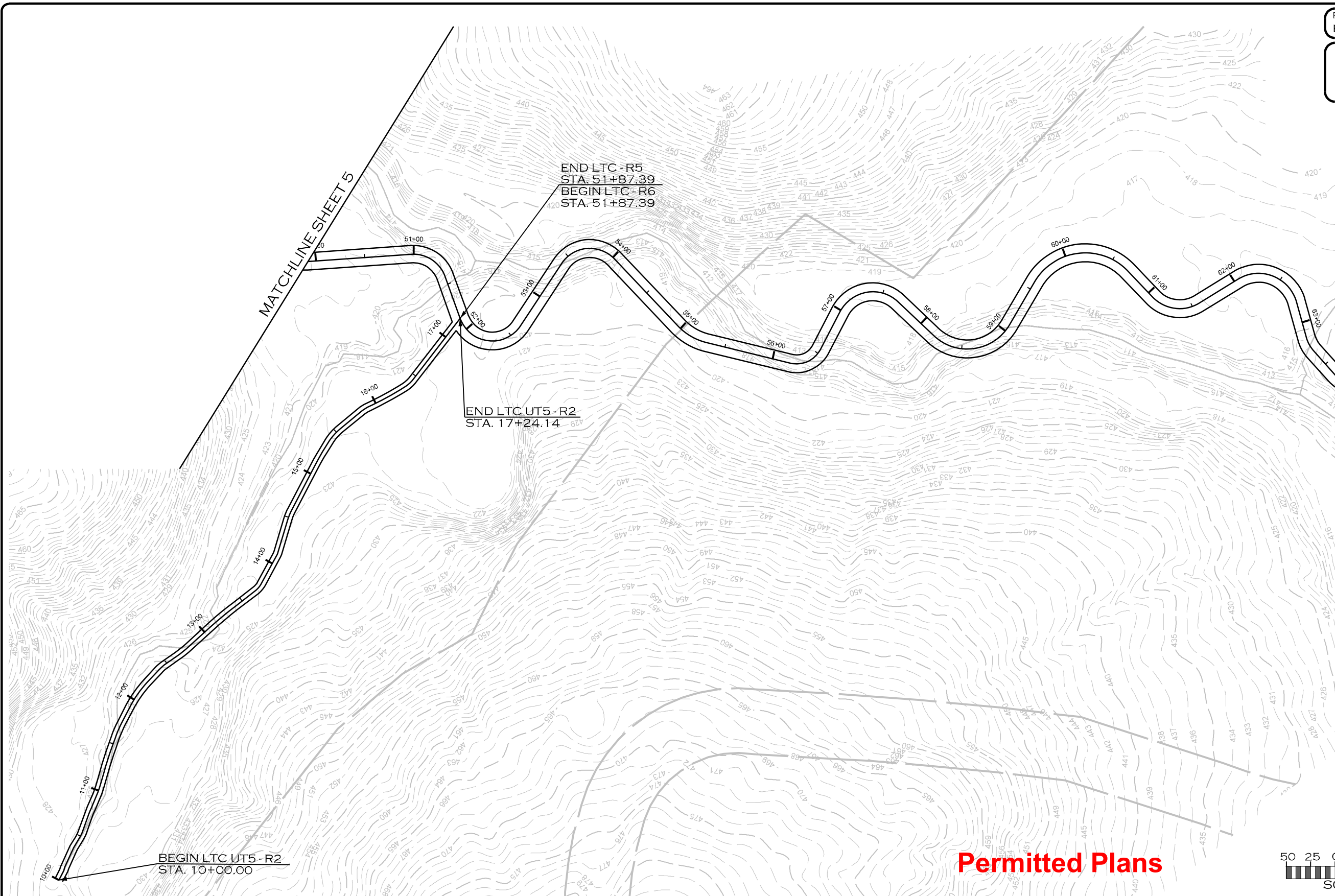


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LICENSE # 5371

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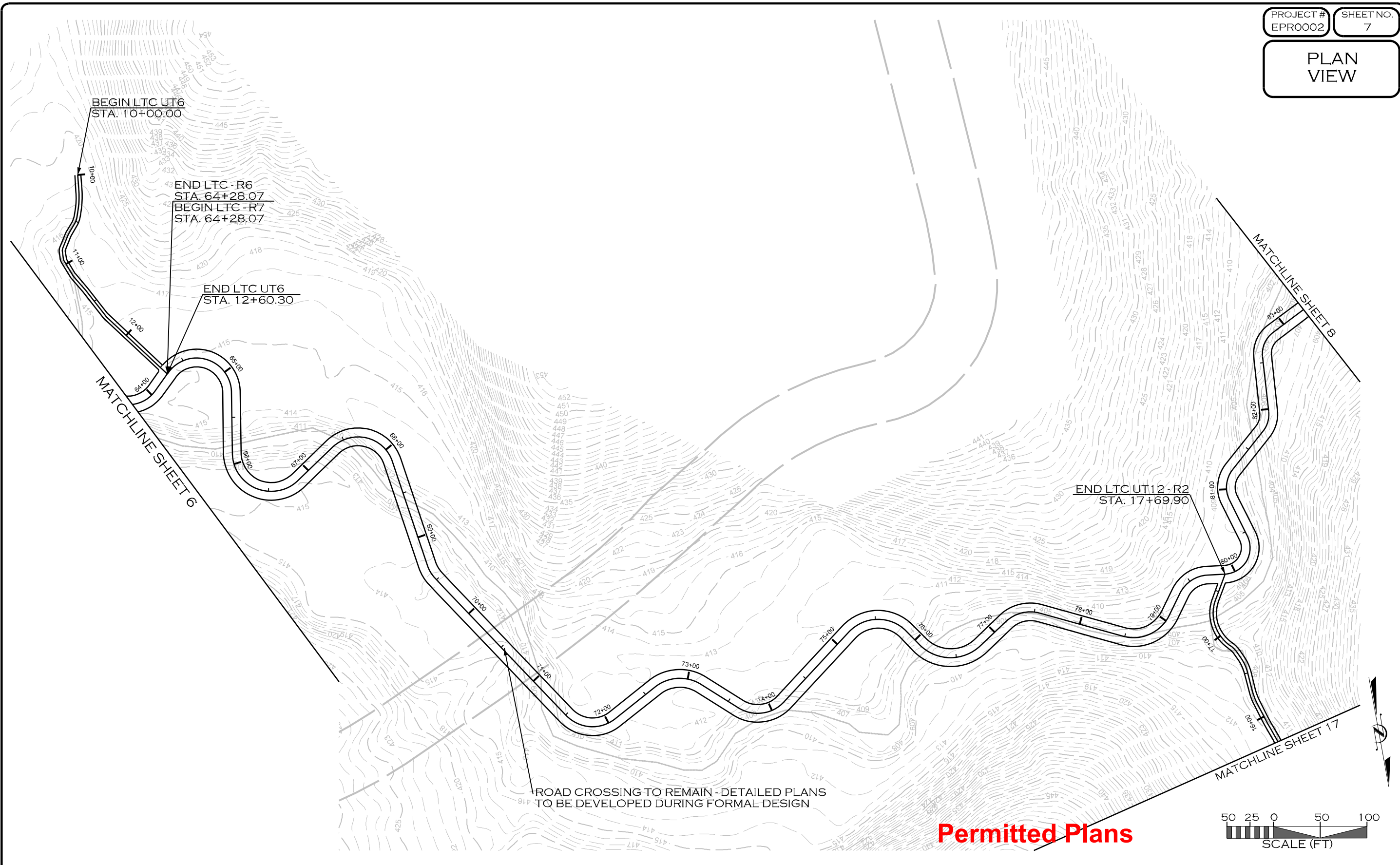
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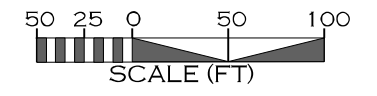
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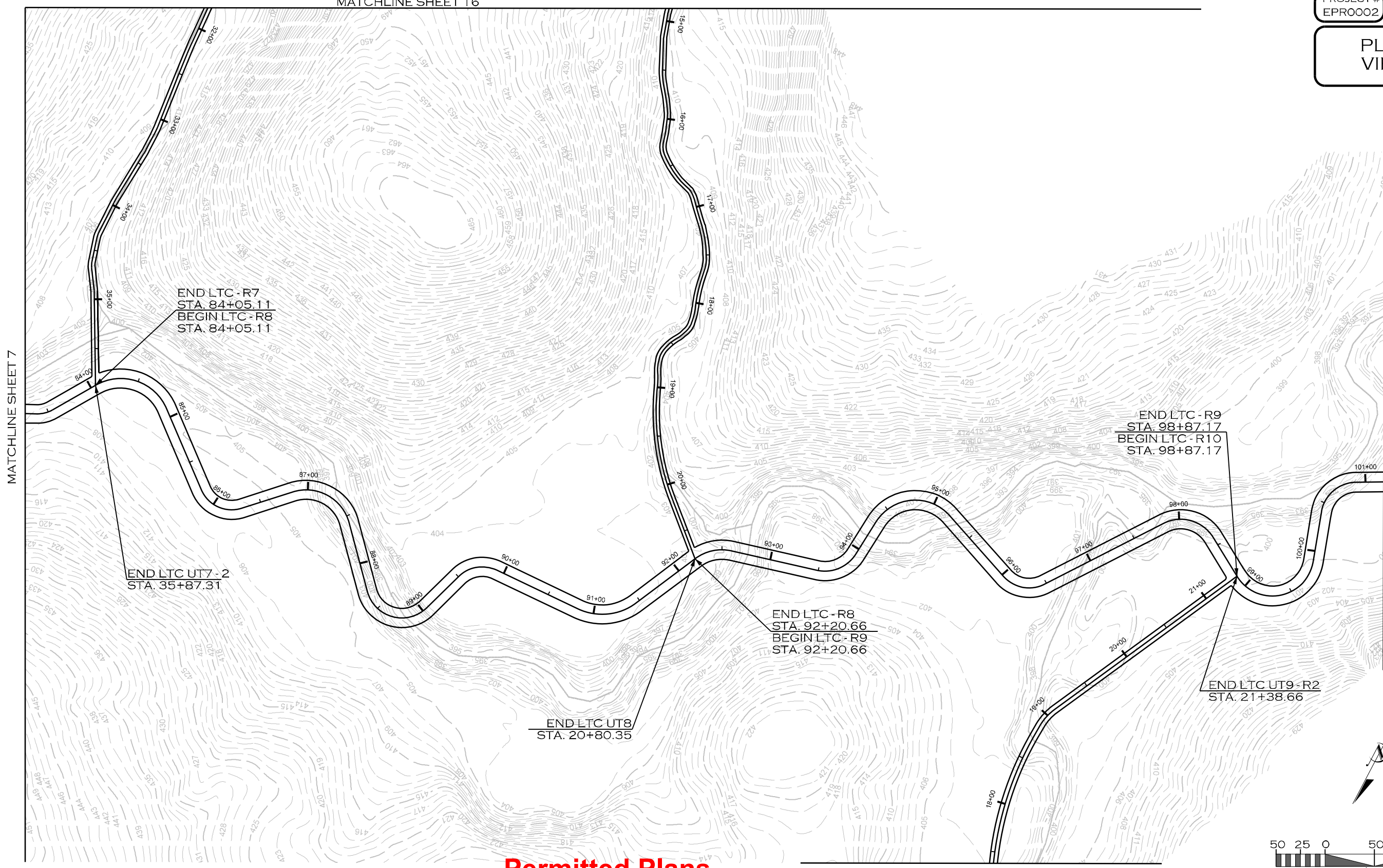
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LITTLE TURKEY CREEK WATERSHED  
CHESTER COUNTY, SOUTH CAROLINA

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**ECOSYSTEM  
PLANNING &  
RESTORATION**

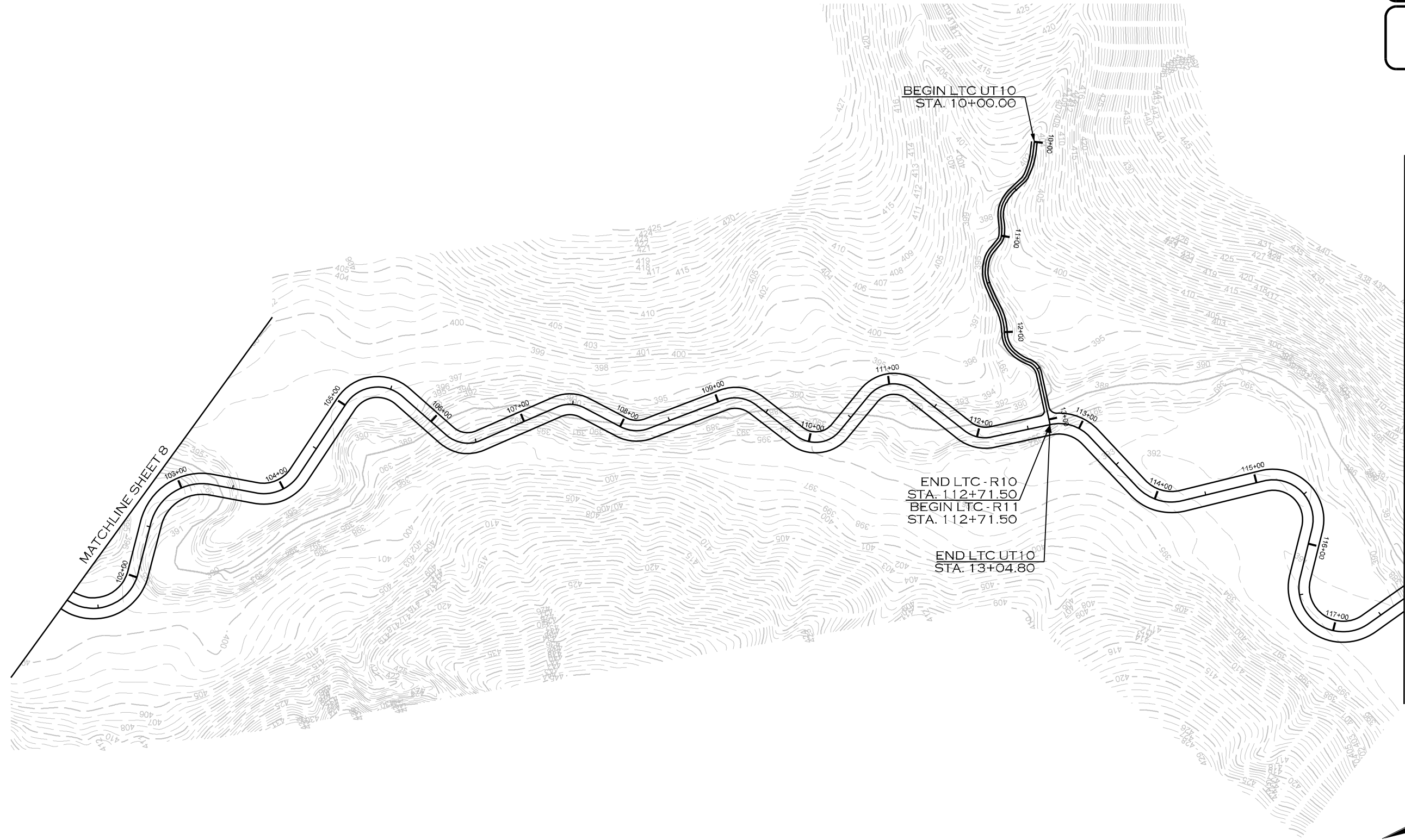
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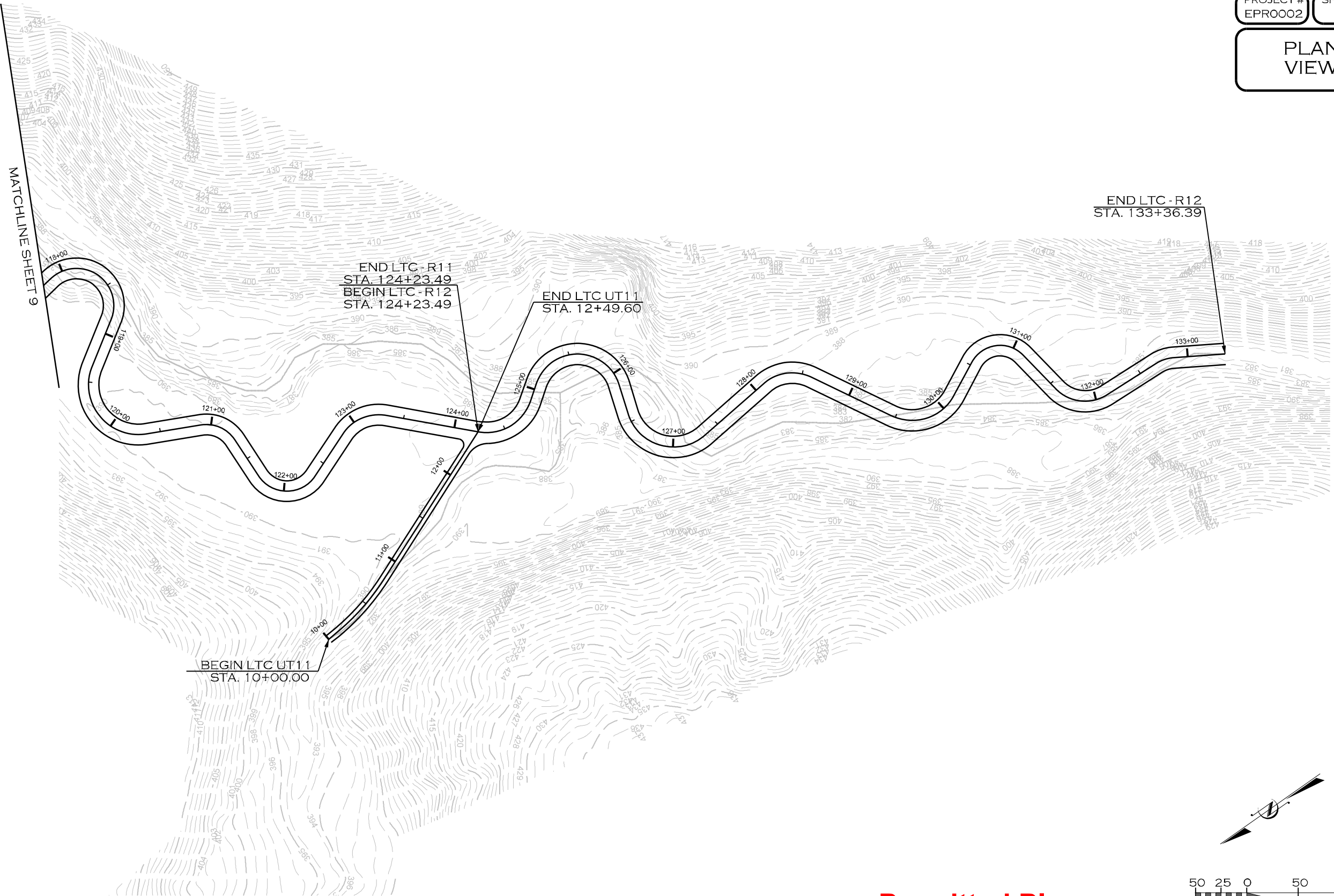
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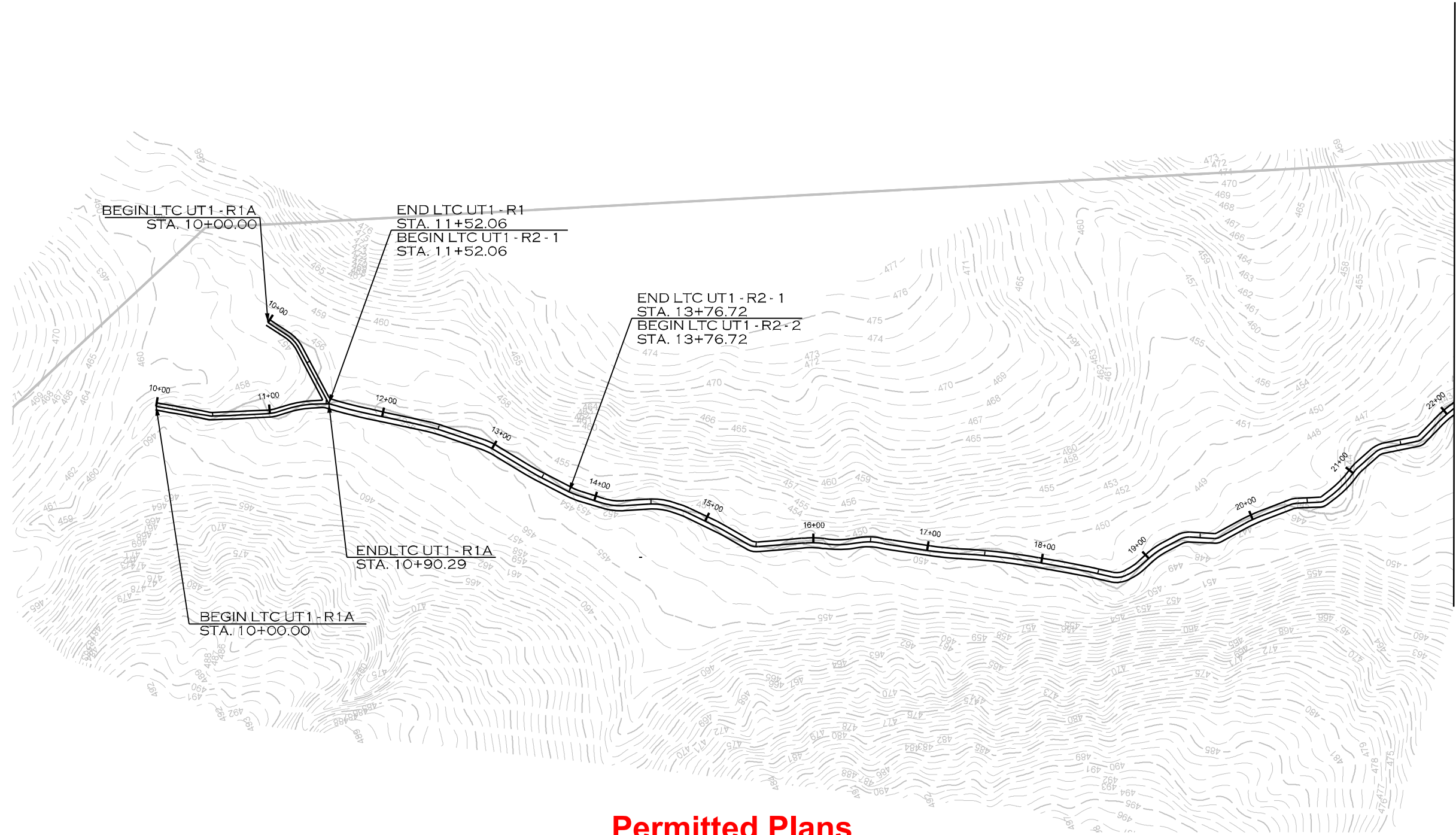
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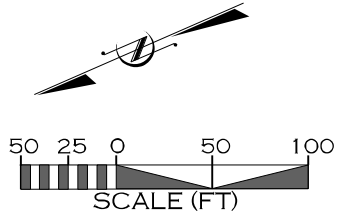
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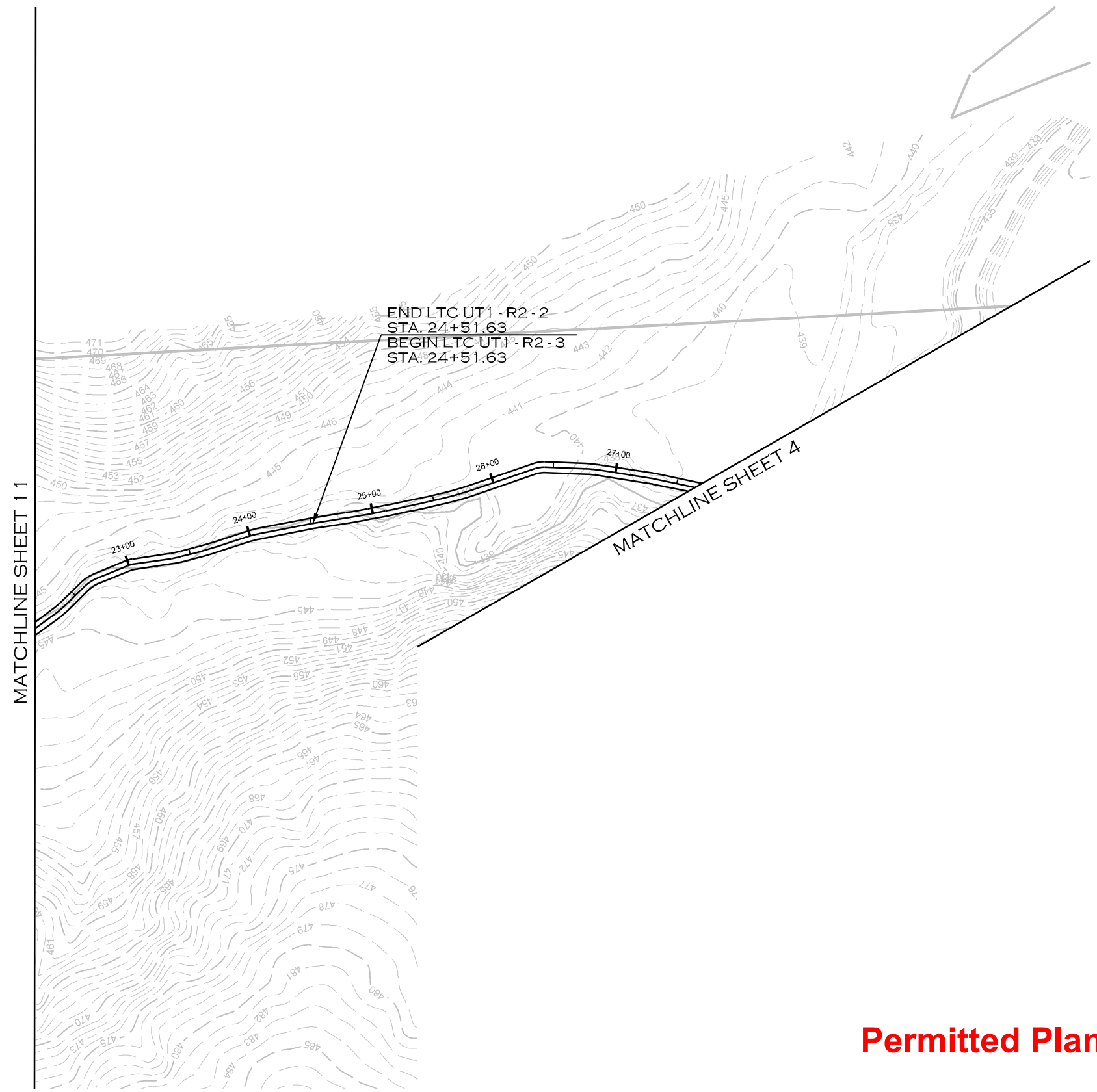
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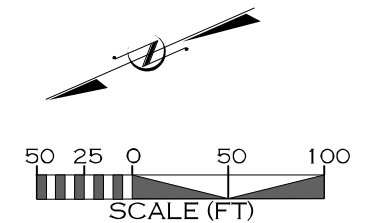
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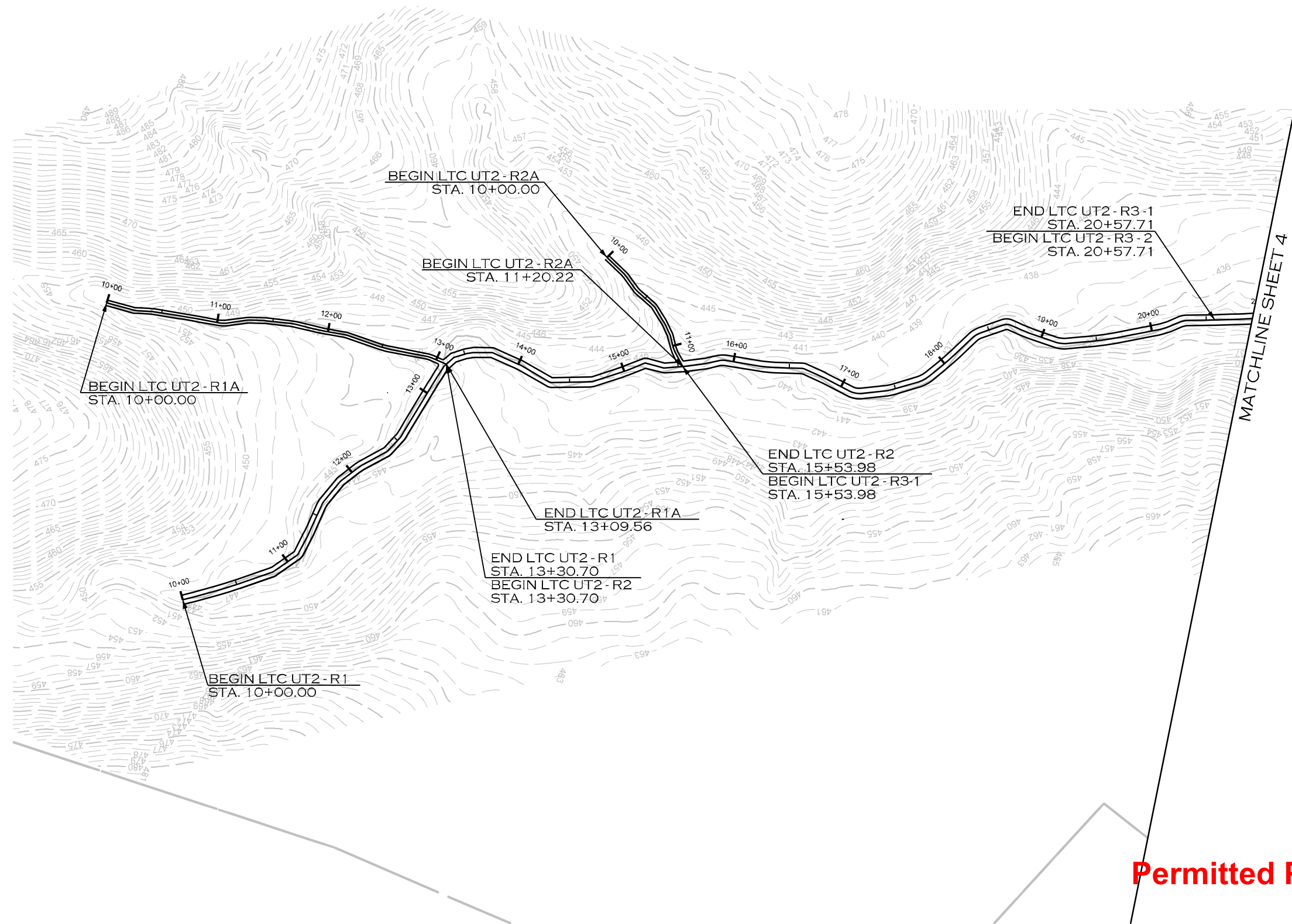


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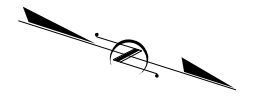
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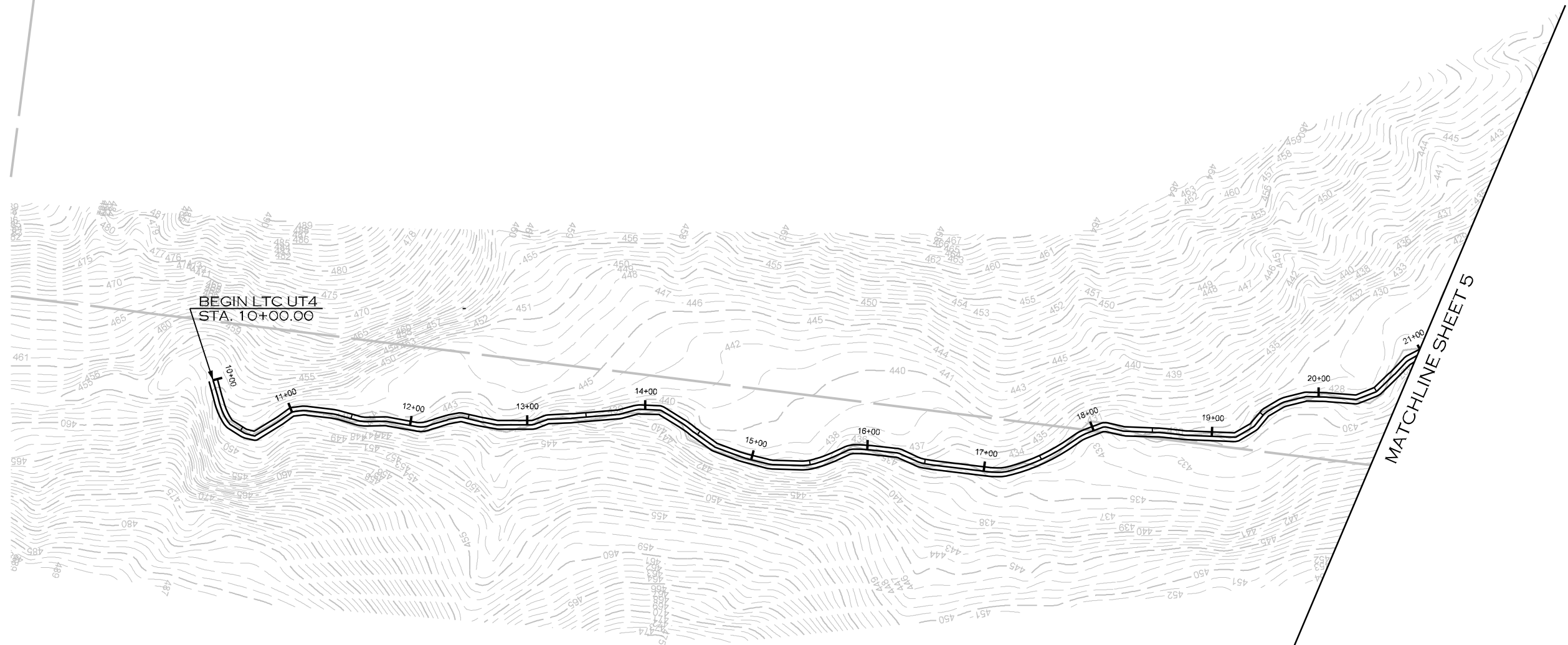


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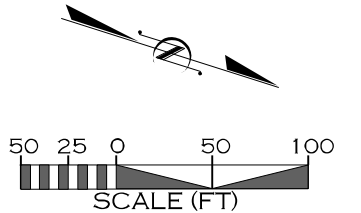
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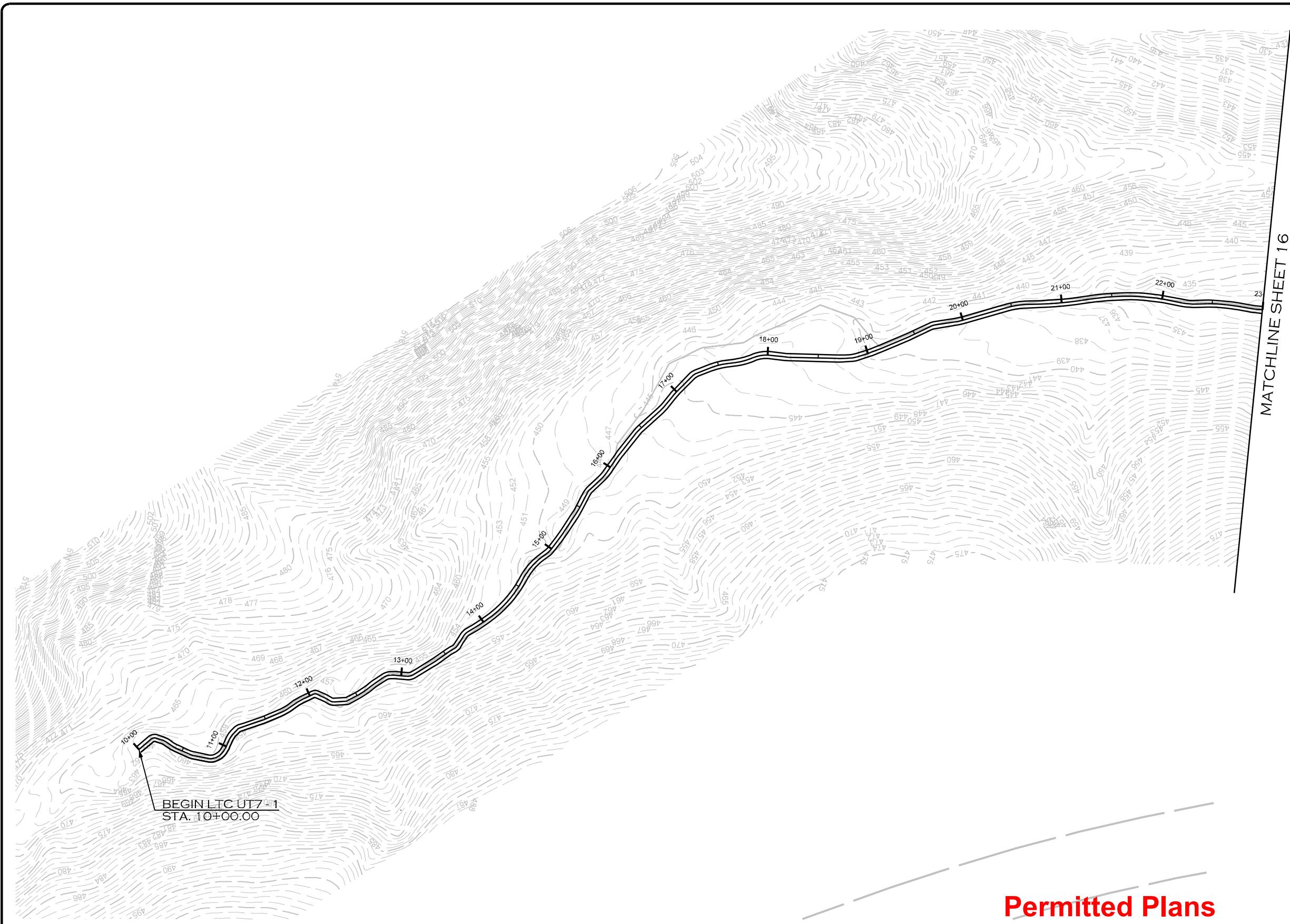
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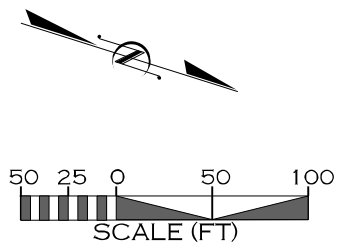
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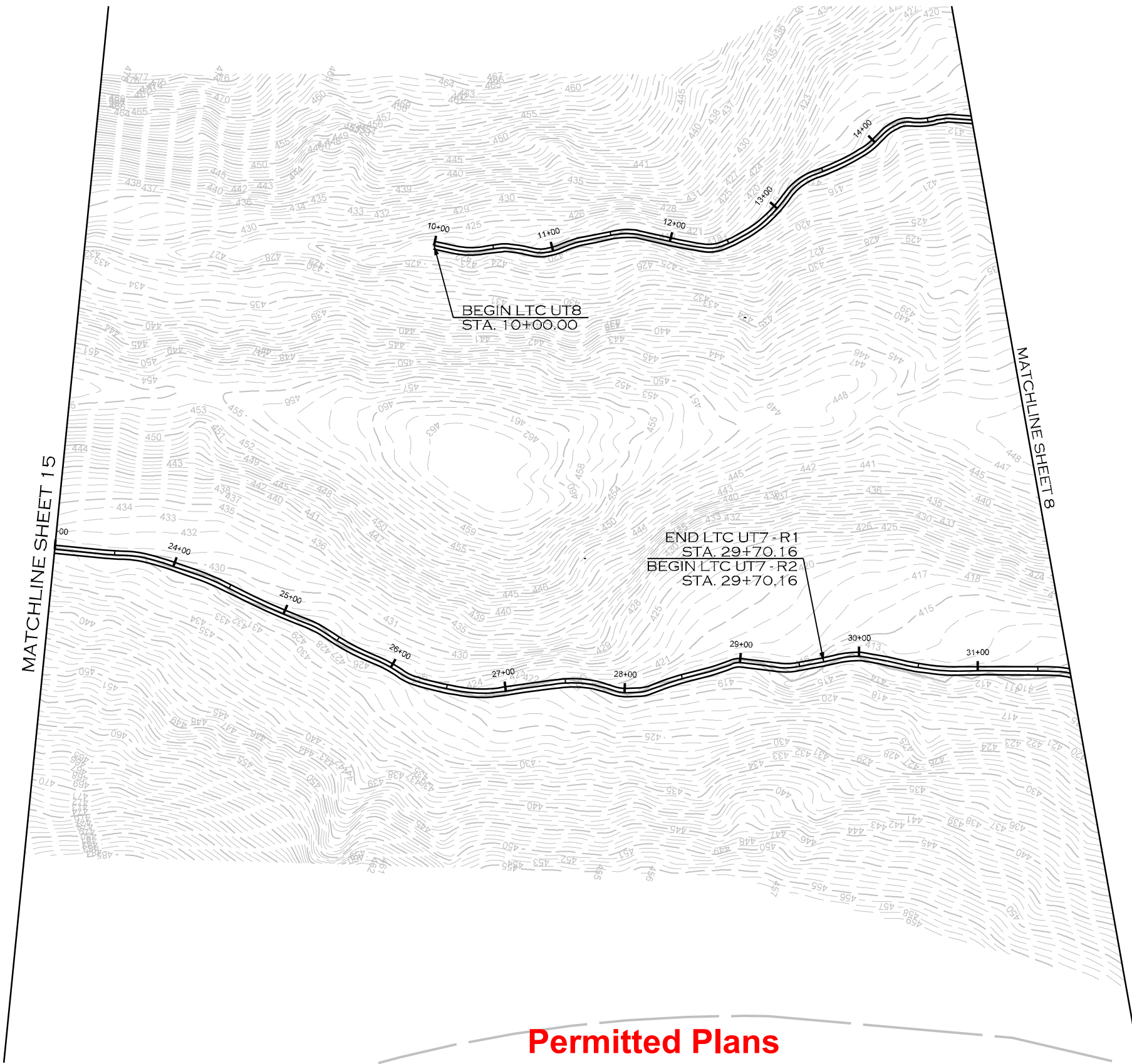


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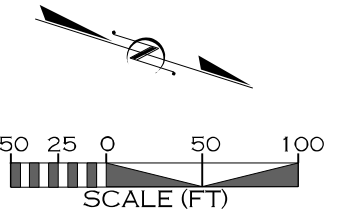
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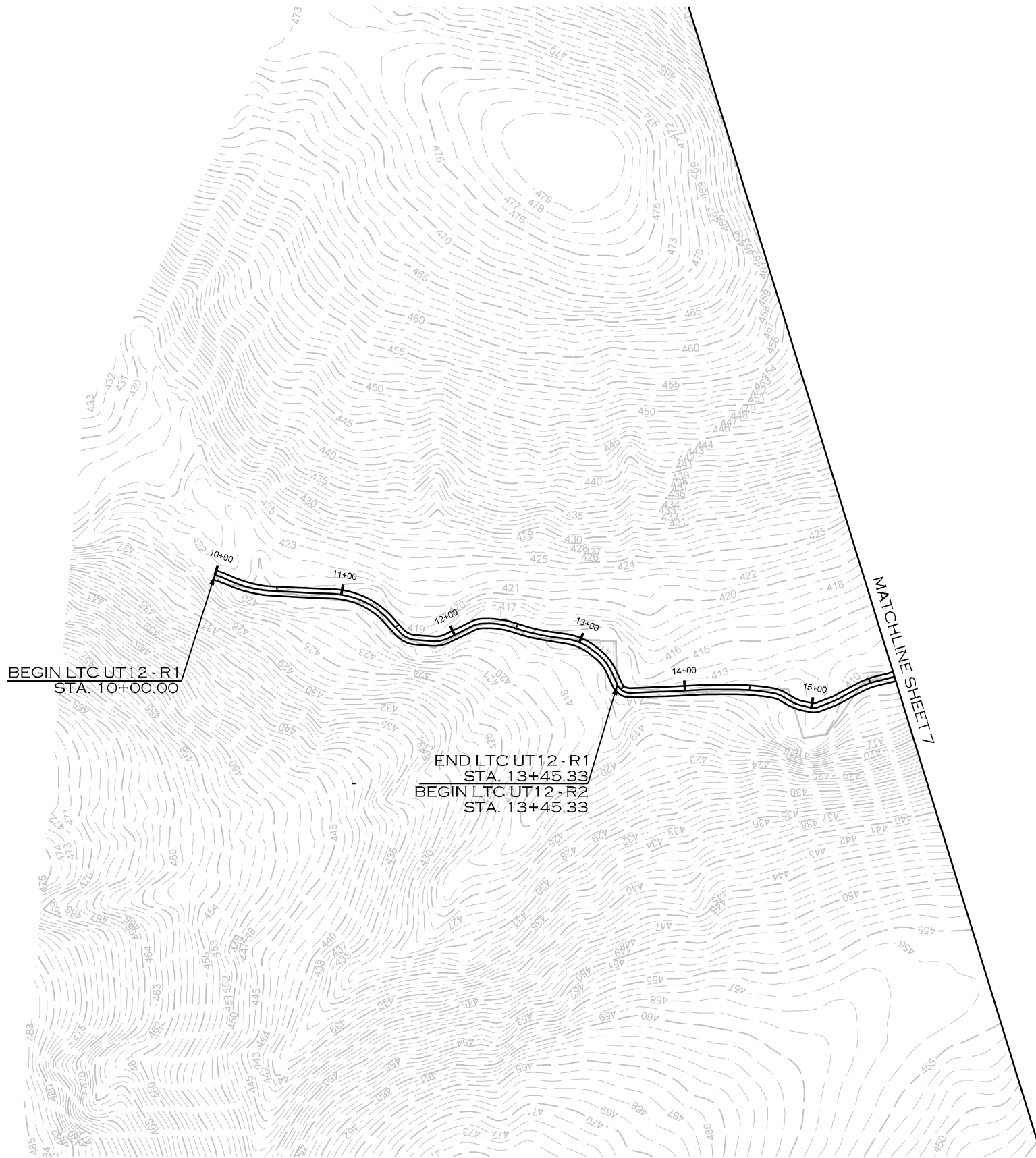
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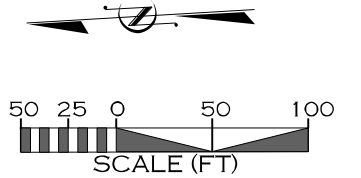
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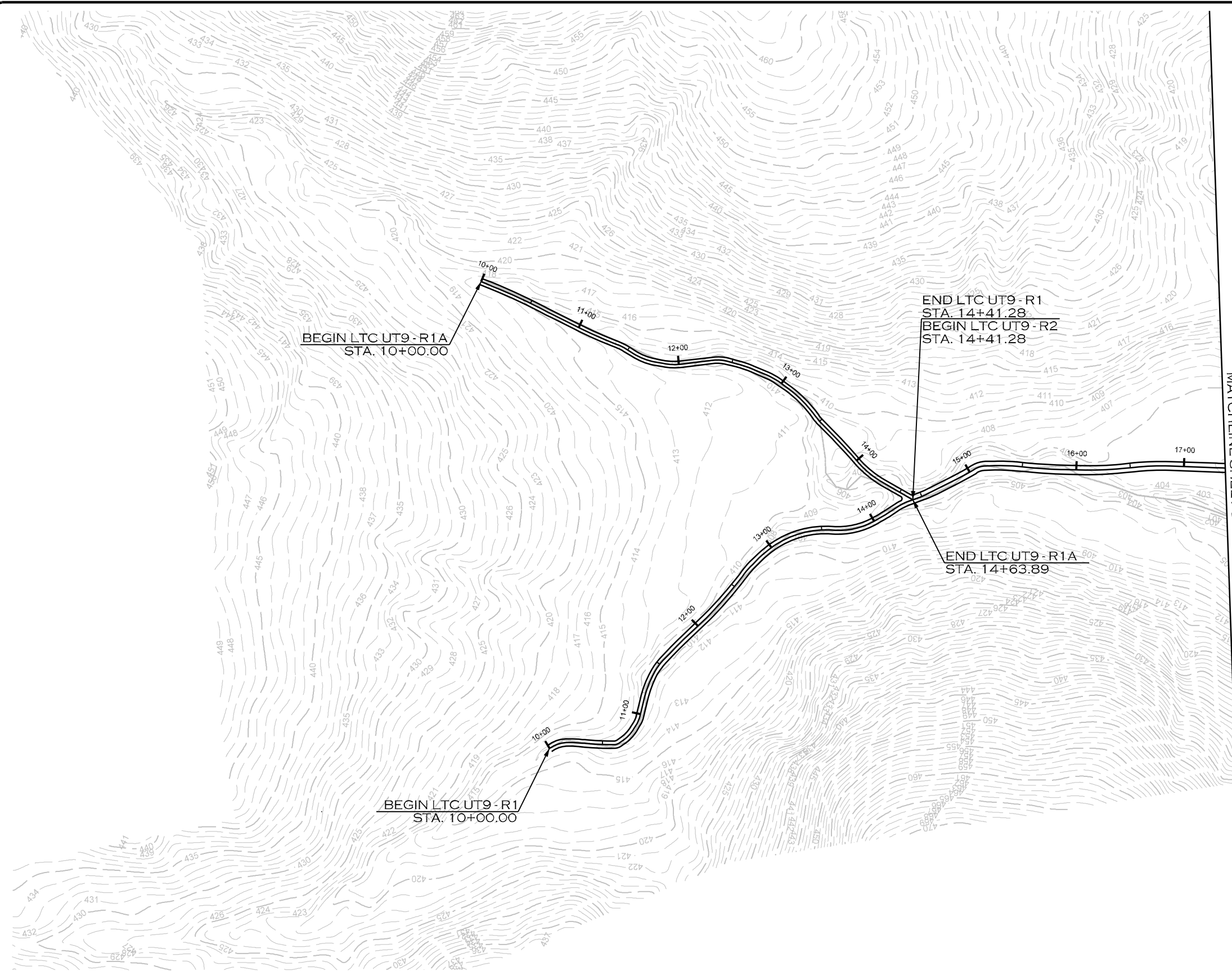
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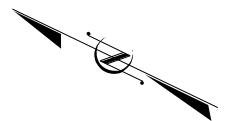
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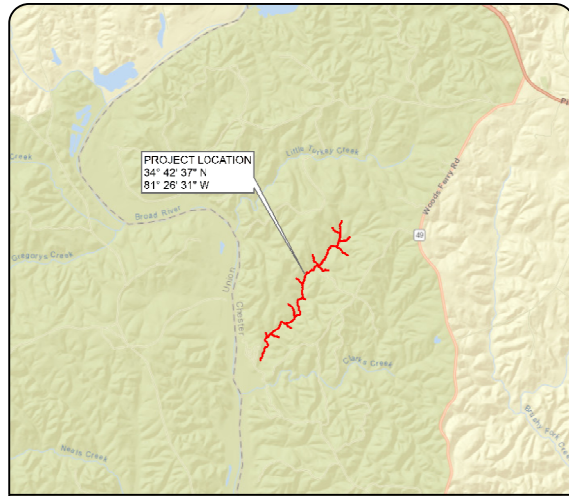
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SUMTER NATIONAL FOREST ENROEE RANGER DISTRICT STREAM AND RIPARIAN RESTORATION/ENHANCEMENT PROJECT



VICINITY MAP

INDEX OF SHEETS

- 1... TITLE SHEET
- 1A... STREAM CONVENTIONAL SYMBOLS  
GENERAL NOTES
- 2... TYPICAL SECTIONS
- 2A-2M... DETAILS
- 3A... TABLES
- 4-15... PLAN VIEW

# SC DEPARTMENT OF COMMERCE FOR SCOUT MOTORS

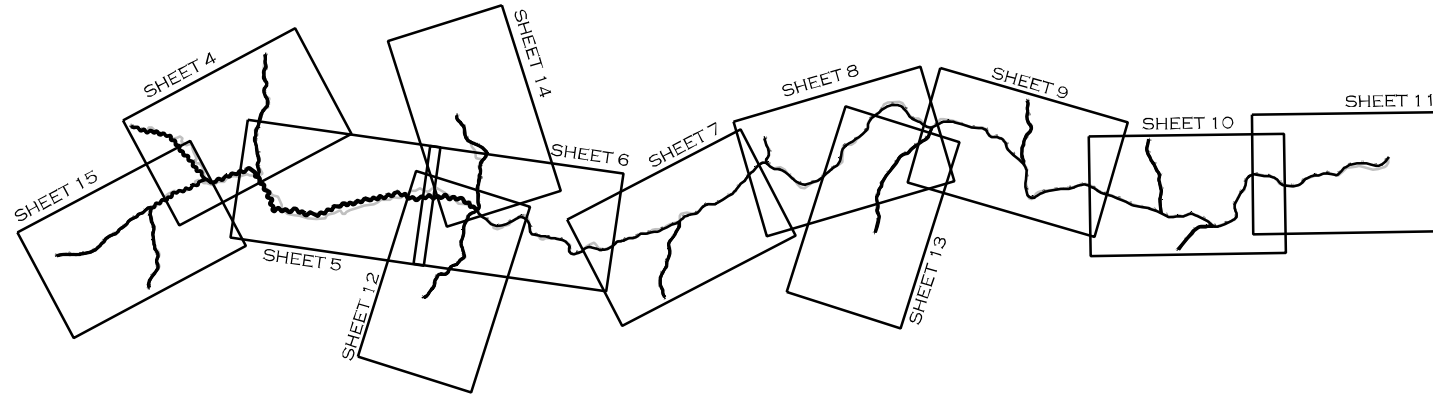
# CHESTER COUNTY

LOCATION: UT TO CLARKS CREEK, CHESTER COUNTY, SC  
TYPE OF WORK: STREAM RESTORATION AND  
STREAM ENHANCEMENT

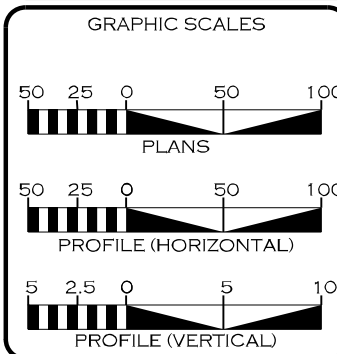
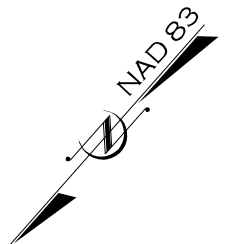
USACE PERMIT NO: SAS-2023-00690

STATE	PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
SC	EPR0002	1	29

PROPOSED DESIGN STREAM LENGTH
EXISTING STREAM LENGTH = 20,724'
PROPOSED STREAM LENGTH = 20,955'



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LETTING DATE: \_\_\_\_\_

ERIN BENNETT, PE  
PROJECT ENGINEER

PROJECT ENGINEER

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SYMBOLGY / NOTES

STREAM CONVENTIONAL SYMBOLS

- ROCK J-HOOK (JH)
- ROCK VANE (RV)
- OFFSET ROCK CROSS VANE (OV)
- GRADE CONTROL J-HOOK VANE (RJH)
- ROCK CROSS VANE (XV)
- TEMPORARY SILT CHECK
- ROOT WAD (RW)
- LOG J-HOOK (JH)
- LOG VANE (LV)
- LOG STEP (LS)
- ROCK STEP (RS)
- LOG CROSS VANE (XV)
- CONSTRUCTED RIFFLE (CR)
- CONSTRUCTED CASCADE (CC)
- WOODY VALLEY GRADE CONTROL (WV/GC)
- LOG ROLLER (LR)
- GRADE CONTROL WOODY RIFFLE (WFR)
- GEOLIFT (GL)
- SF — SAFETY FENCE
- TP — TAPE FENCE
- ||| — SILT FENCE
- CE — CONSERVATION EASEMENT
- - 20 - - EXISTING MAJOR CONTOUR
- - - - EXISTING MINOR CONTOUR
- - - - - LIMITS OF DISTURBANCE
- 10+00 — BANKFULL BENCH (GRADE)
- STREAM THALWEG
- STREAM TOP OF BANKS
- ( ) FOOT BRIDGE
- ( ) TEMPORARY STREAM CROSSING
- ( ) PERMANENT STREAM CROSSING
- ( ) TRANSPLANTED VEGETATION
- ( ) TREE REMOVAL
- ( ) TREE PROTECTION
- ( ) CHANNEL PLUG
- ( ) CHANNEL FILL / DITCH PLUG
- ( ) GRADE BANK
- ( ) LOG STEP POOL (SP)
- ( ) TOEWOOD (TW)
- ( ) SOD MATS (SM)
- ( ) DEBRIS JAM (DJ)
- ( ) JUNCUS PLUG (JP)

\*\*NOTE: ALL ITEMS ABOVE MAY NOT BE USED ON THIS PROJECT

GENERAL NOTES

- NO CONSTRUCTION WORK SHALL COMMENCE BEFORE AN ONSITE MEETING WITH THE ENGINEER, CLIENT, US FOREST SERVICE, AND CONTRACTOR.
- WORK IS BEING PERFORMED AS AN ENVIRONMENTAL RESTORATION PROJECT. THE CONTRACTOR SHALL MAKE ALL REASONABLE EFFORTS TO REDUCE SEDIMENT LOSS AND MINIMIZE DISTURBANCE OF THE SITE WHILE PERFORMING CONSTRUCTION WORK.
- THE CONTRACTOR IS REQUIRED TO INSTALL INSTREAM STRUCTURES USING A TRACK HOE EXCAVATOR WITH A HYDRAULIC THUMB OF SUFFICIENT SIZE TO PLACE BOULDERS AND STRUCTURES.
- CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL UTILITIES ARE ADEQUATELY LOCATED AND MARKED DURING CONSTRUCTION.
- ANY DAMAGE TO EXISTING ROADS, STRUCTURES, FACILITIES, ETC. RESULTING FROM ACTIONS OF THE CONTRACTOR WILL BE REPAIRED OR REPLACED AT THE EXPENSE OF THE CONTRACTOR, TO A QUALITY MEETING OR EXCEEDING THE PREVIOUS STANDARDS.
- WORK IS BEING PERFORMED IN A NATIONAL FOREST WITH PUBLIC ACCESS. CONTRACTOR SHALL ENSURE THAT ALL WORK IS CONDUCTED SAFELY, AND THAT THE SAFETY OF THE GENERAL PUBLIC IS ENSURED DURING ALL PHASES OF THE CONSTRUCTION WORK.
- IN THE EVENT OF A SPILL OR ILLICIT DISCHARGE, CONTACT THE ENOREE RANGER DISTRICT OFFICE AT (803) 276-4810.
- CONTRACTOR SHALL INSPECT ALL SAFETY AND EROSION CONTROL DEVICES, STRUCTURES, AND WORKS AT THE START OF EACH WORK DAY TO ENSURE THEY ARE PROPERLY PLACED AND FUNCTIONING.
- CONTRACTOR SHALL MAINTAIN ALL VEHICLES AND EQUIPMENT TO PREVENT DISCHARGE OF FUEL OR FLUIDS. ANY IDENTIFIED LEAKING EQUIPMENT SHALL BE REMOVED FROM THE WORK AREA AND SHALL BE REPAIRED AS SOON AS FEASIBLE.

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PROJECT ENGINEER

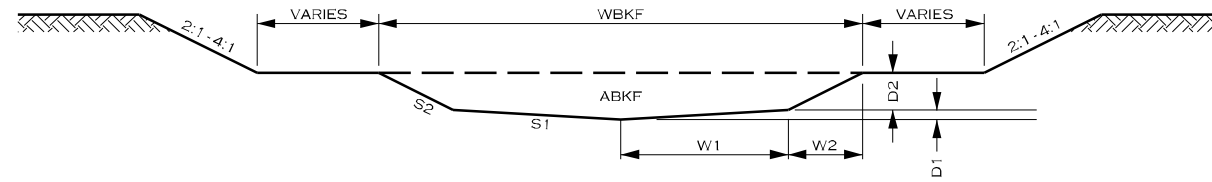
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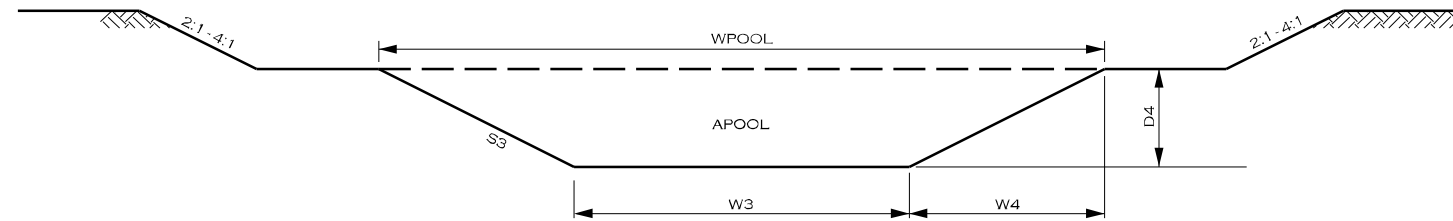
TYPICAL SECTIONS

DETAILS

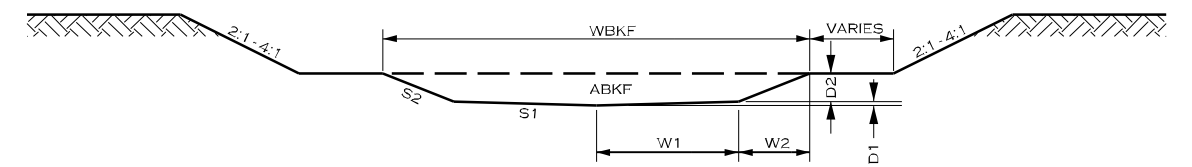
"B" AND "Bc" TYPE CHANNELS



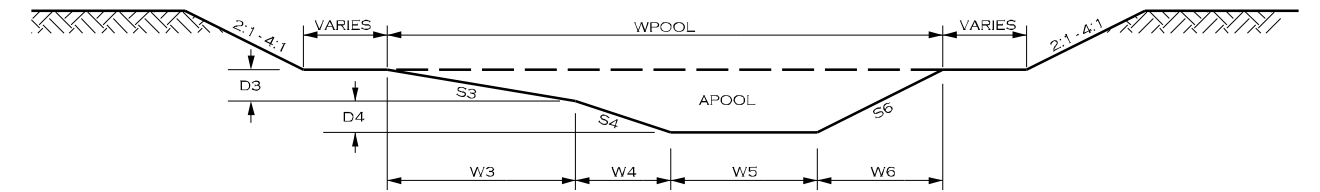
TYPICAL RIFFLE CROSS SECTION



"C", "Cb", AND "E" TYPE CHANNELS



TYPICAL RIFFLE CROSS SECTION



TYPICAL POOL RIGHT CROSS SECTION

C, Cb, E STREAM, and MEANDERING TYPE REPRESENTATIVE CROSS SECTION DIMENSIONS

Stream	Sheet Range	Station Range	RIFFLES								POOLS										
			ABKF	WBKF	W1	W2	D1	D2	S1	S2	APOOL	WPOOL	W3	W4	W5	W6	D3	D4	S3	S4	S6
UTCC-R1	4	10+00.00 - 19+01.86	6.9	9.1	2.0	2.5	0.13	1.01	16:1	2.5:1	16.8	13.6	4.5	2.3	2.3	4.5	1.14	1.14	4:1	2:1	2:1
UTCC-R2	4	19+01.86 - 24+34.49	9.0	10.4	2.3	2.9	0.14	1.15	16:1	2.5:1	21.9	15.6	5.2	2.6	2.6	5.2	1.30	1.30	4:1	2:1	2:1
UTCC-R3	4 - 6	24+34.49 - 47+96.69	12.0	12.0	2.7	3.3	0.17	1.33	16:1	2.5:1	29.3	18.0	6.0	3.0	3.0	6.0	1.50	1.50	4:1	2:1	2:1
UTCC-R4	6 - 8	47+96.69 - 74+95.02	16.0	13.9	3.1	3.8	0.19	1.54	16:1	2.5:1	39.0	20.8	6.9	3.5	3.5	6.9	1.73	1.73	4:1	2:1	2:1
UTCC-R5	8	74+95.02 - 91+64.90	18.6	14.9	3.3	4.1	0.21	1.66	16:1	2.5:1	45.3	22.4	7.5	3.7	3.7	7.5	1.87	1.87	4:1	2:1	2:1
UTCC-R6	9	91+64.90 - 100+11.01	19.6	15.3	3.4	4.3	0.21	1.70	16:1	2.5:1	47.8	23.0	7.7	3.8	3.8	7.7	1.92	1.92	4:1	2:1	2:1
UTCC-R7	9 - 10	100+11.01 - 117+91.78	20.9	15.8	3.5	4.4	0.22	1.76	16:1	2.5:1	50.9	23.8	7.9	4.0	4.0	7.9	1.98	1.98	4:1	2:1	2:1
UTCC-R8	10 - 11	117+91.78 - 135+33.31	23.1	16.6	3.7	4.6	0.23	1.85	16:1	2.5:1	56.3	25.0	8.3	4.2	4.2	8.3	2.08	2.08	4:1	2:1	2:1
UTCC-UT1-R2	15, 4	18+60.49 - 24+21.77	4.2	7.1	1.6	2.0	0.10	0.79	16:1	2.5:1	10.2	10.6	3.5	1.8	1.8	3.5	0.89	0.89	4:1	2:1	2:1

B, Bc, and STEP-POOL STREAM TYPE REPRESENTATIVE CROSS SECTION DIMENSIONS

Stream	Sheet Range	Station Range	RIFFLES								POOLS					
			ABKF	WBKF	W1	W2	D1	D2	S1	S2	APOOL	WPOOL	W3	W4	D4	S3
UTCC-UT1a	15	10+00.00 - 16+56.24	2.6	5.6	1.2	1.6	0.08	0.6	16:1	2.5:1	5.7	8.4	1.1	3.6	1.21	3:1
UTCC-UT1-R1	15	10+00.00 - 18+60.49	2.6	5.6	1.2	1.6	0.08	0.62	16:1	2.5:1	5.7	8.4	1.1	3.6	1.21	3:1
UTCC-UT2	4	10+00.00 - 19+99.08	4.2	7.1	1.6	2.0	0.10	0.79	16:1	2.5:1	9.3	10.6	1.4	4.6	1.54	3:1
UTCC-UT3	14, 6	10+00.00 - 18+61.68	3.7	6.7	1.5	1.9	0.09	0.74	16:1	2.5:1	8.2	10.0	1.3	4.3	1.44	3:1
UTCC-UT4-R1	12, 6	10+00.00 - 15+84.20	2.2	5.1	1.1	1.4	0.07	0.57	16:1	2.5:1	4.9	7.7	1.0	3.3	1.11	3:1
UTCC-UT4-R2	6	15+84.20 - 18+87.01	2.3	5.3	1.2	1.5	0.07	0.58	16:1	2.5:1	5.1	7.9	1.1	3.4	1.14	3:1
UTCC-UT5	8	10+00.00 - 12+07.43	5.2	7.9	1.8	2.2	0.11	0.88	16:1	2.5:1	11.5	11.8	1.6	5.1	1.71	3:1
UTCC-UT6	13, 8	10+00.00 - 19+94.87	2.9	5.9	1.3	1.6	0.08	0.66	16:1	2.5:1	6.4	8.8	1.2	3.8	1.28	3:1
UTCC-UT7	9	10+00.00 - 15+21.71	2.7	5.7	1.3	1.6	0.08	0.63	16:1	2.5:1	6.0	8.5	1.1	3.7	1.23	3:1
UTCC-UT8	10	10+00.00 - 13+44.55	4.5	7.3	1.6	2.0	0.10	0.82	16:1	2.5:1	9.9	11.0	1.5	4.8	1.59	3:1
UTCC-UT9	7	10+00.00 - 16+28.65	2.5	5.5	1.2	1.5	0.08	0.61	16:1	2.5:1	5.5	8.2	1.1	3.6	1.19	3:1
UTCC-UT10	10	10+00.00 - 15+97.20	2.1	5.0	1.1	1.4	0.07	0.56	16:1	2.5:1	4.6	7.5	1.0	3.3	1.09	3:1

Permitted Plans

REVISIONS

NO.	DESCRIPTION	ENGR.	APPROV.	DATE
1	PERMITTING DESIGN PLANS	EB	KLT	10/25/23

PREPARED FOR:



SUMTER NATIONAL FOREST  
ENROEE RANGER DISTRICT  
STREAM AND RIPARIAN RESTORATION/  
ENHANCEMENT PROJECT  
UT TO CLARKS CREEK WATERSHED  
CHESTER COUNTY, SOUTH CAROLINA

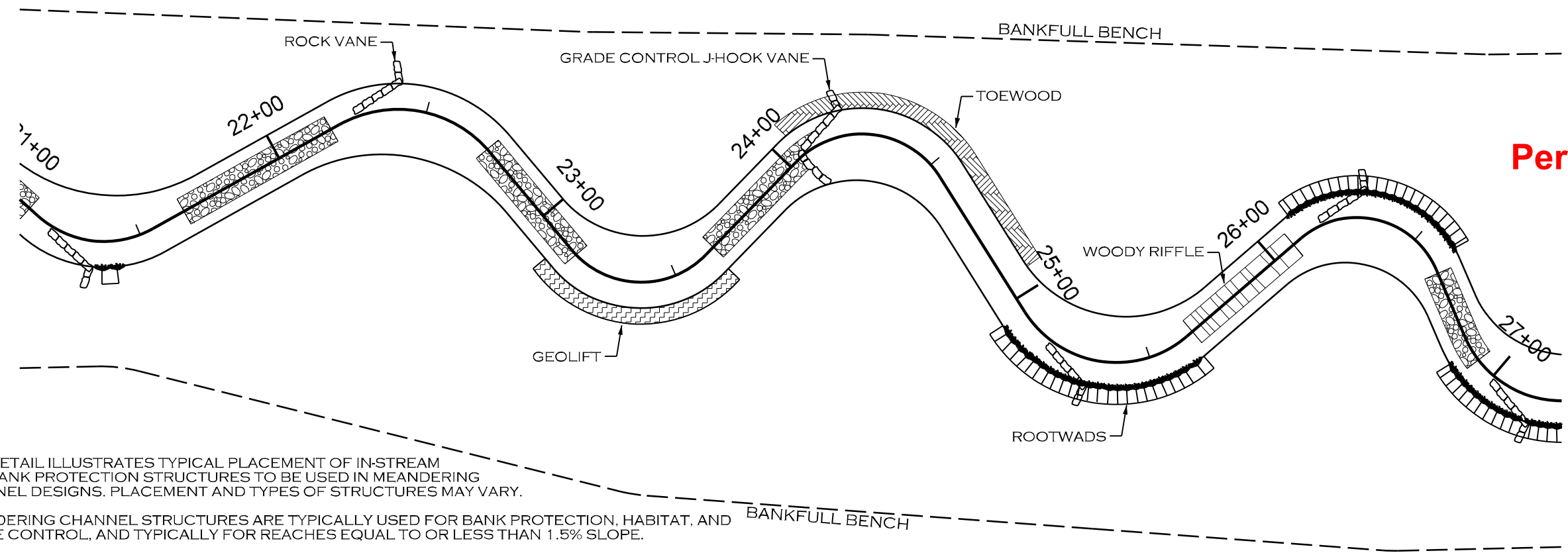
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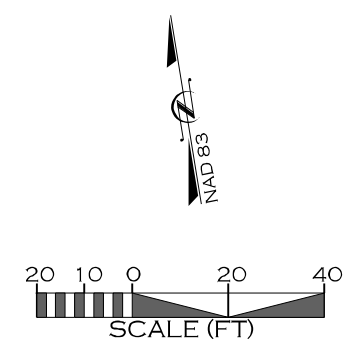
TYPICAL STRUCTURE PLACEMENT  
MEANDERING CHANNEL DESIGN



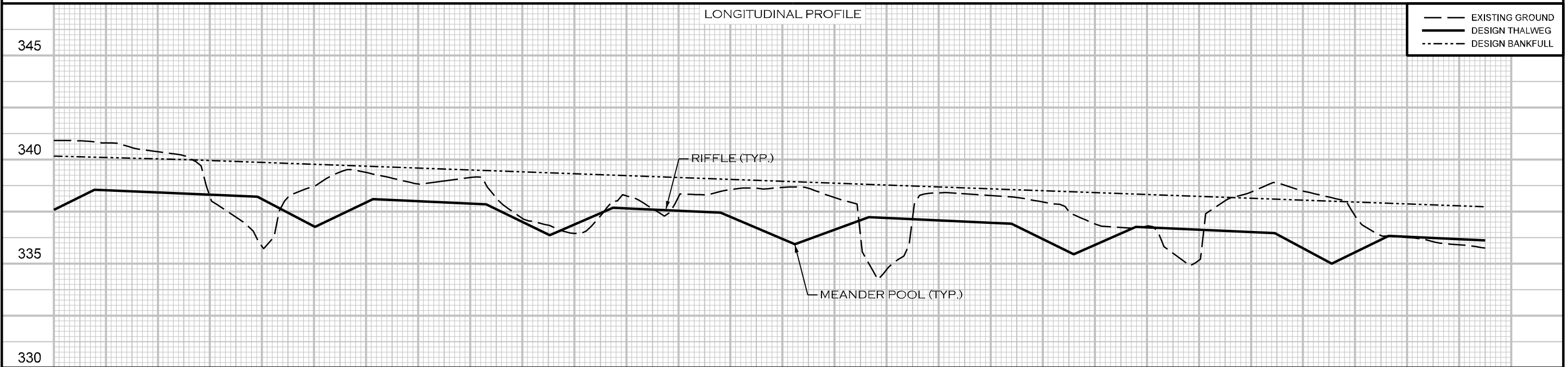
Permitted Plans

NOTES:

1. THIS DETAIL ILLUSTRATES TYPICAL PLACEMENT OF IN-STREAM AND BANK PROTECTION STRUCTURES TO BE USED IN MEANDERING CHANNEL DESIGNS. PLACEMENT AND TYPES OF STRUCTURES MAY VARY.
2. MEANDERING CHANNEL STRUCTURES ARE TYPICALLY USED FOR BANK PROTECTION, HABITAT, AND GRADE CONTROL, AND TYPICALLY FOR REACHES EQUAL TO OR LESS THAN 1.5% SLOPE.
3. GRADE CONTROL STRUCTURES SHALL BE PLACED TO PREVENT PIPING, EXCESSIVE SCOUR, AND STREAM INCISION AROUND STRUCTURE.
4. SEE DETAILS FOR SPECIFIC STRUCTURES FOR MORE INFORMATION.



LONGITUDINAL PROFILE



— — — EXISTING GROUND  
 — — — DESIGN THALWEG  
 - - - - - DESIGN BANKFULL

21+50      22+00      23+00      24+00      25+00      26+00      27+00

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PREPARED IN THE OFFICE OF:

ECOSYSTEM  
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 RESTORATION

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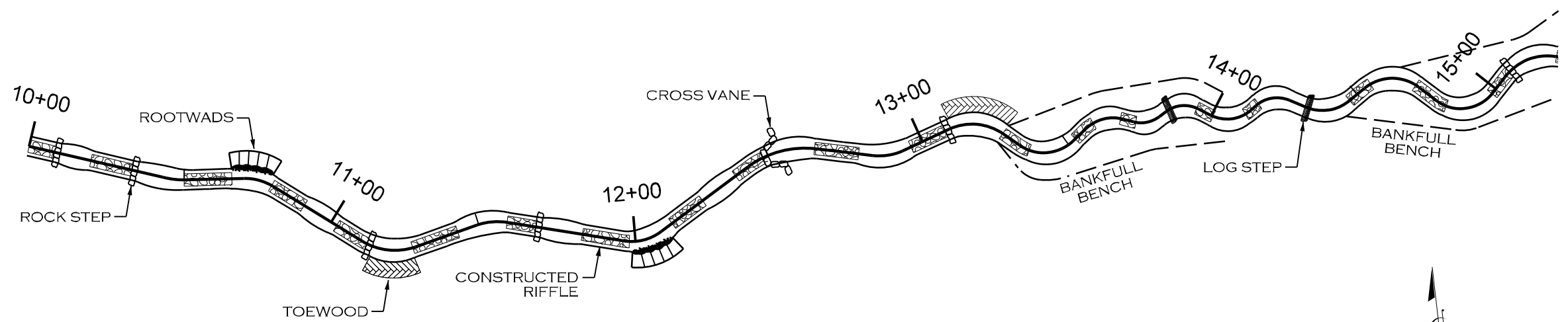


TYPICAL STRUCTURE PLACEMENT  
STEP - POOL CHANNEL DESIGN

PROJECT #  
EPRO002

SHEET NO.  
2B

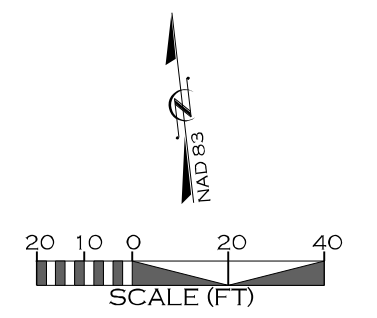
DETAILS



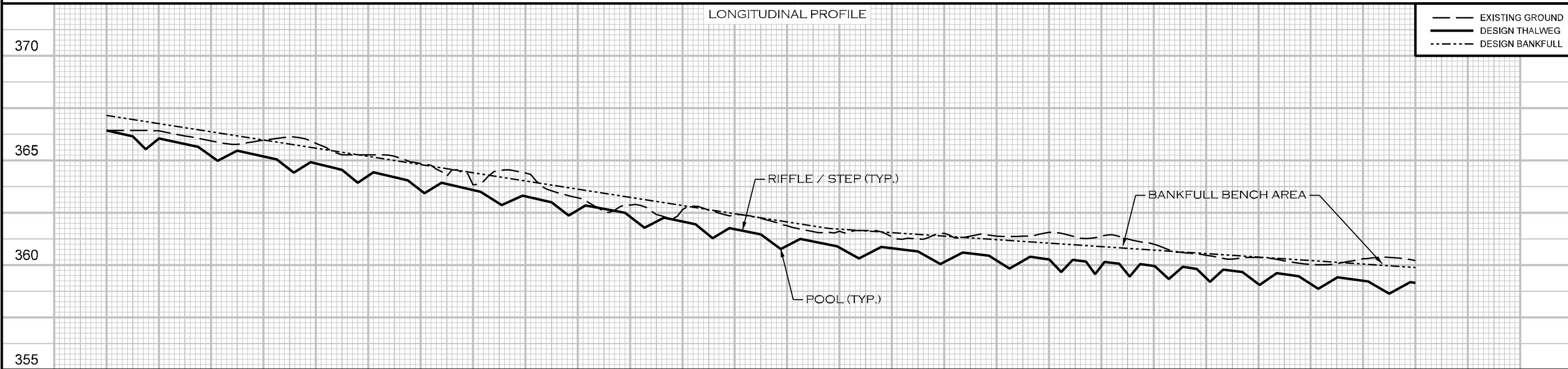
NOTES:

1. THIS DETAIL ILLUSTRATES TYPICAL PLACEMENT OF IN-STREAM AND BANK PROTECTION STRUCTURES TO BE USED IN STEP-POOL CHANNEL DESIGNS. PLACEMENT AND TYPES OF STRUCTURES MAY VARY.
2. STEP-POOL STRUCTURES ARE TYPICALLY USED FOR REACHES WITH SLOPES IN EXCESS OF 1.5%.
3. GRADE CONTROL STRUCTURES SHALL BE PLACED TO PREVENT PIPING, EXCESSIVE SCOUR, AND STREAM INCISION AROUND STRUCTURE
4. SEE DETAILS FOR SPECIFIC STRUCTURES FOR MORE INFORMATION.

Permitted Plans



LONGITUDINAL PROFILE



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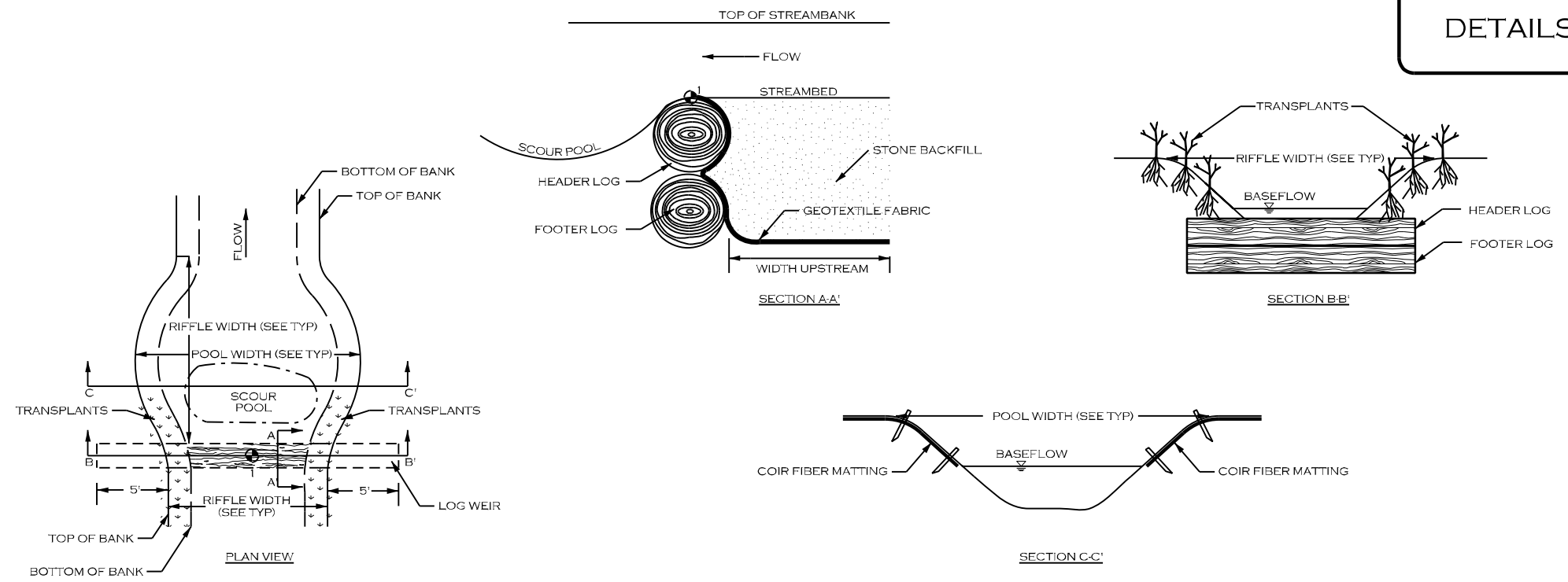
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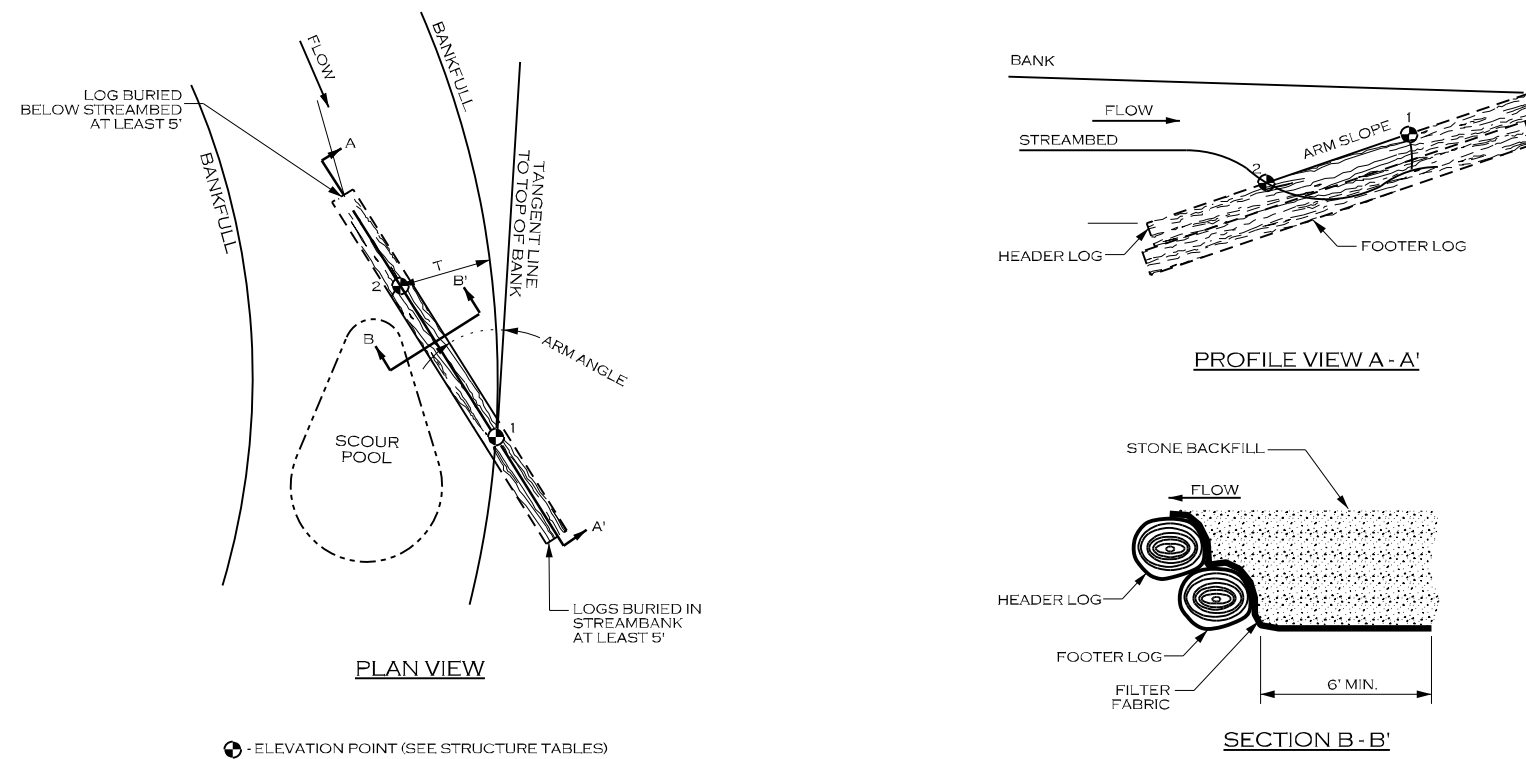
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⊙ - ELEVATION POINT (SEE STRUCTURES TABLE)

LOG STEP SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
LOGS	TYPE: HARDWOOD SIZE: 20 FT LONG, 12 INCH Ø MIN NUMBER OF HEADER LOGS: 1 NUMBER OF FOOTER LOGS: 1
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
<b>NOTES FOR LOG STEP STRUCTURES:</b> 1. LOGS SHOULD BE AT LEAST 12 INCHES IN DIAMETER, RELATIVELY STRAIGHT, HARDWOOD, AND RECENTLY HARVESTED. 2. LOGS >24 INCHES IN DIAMETER MAY BE USED ALONE WITHOUT AN ADDITIONAL LOG. GEOTEXTILE FABRIC SHOULD STILL BE USED TO SEAL AROUND LOG. 3. PLACE FOOTER LOGS FIRST AND THEN HEADER (TOP) LOG. SET HEADER LOG APPROXIMATELY 3 INCHES ABOVE THE INVERT ELEVATION. 4. CUT A NOTCH IN THE HEADER LOG APPROXIMATELY 50 PERCENT OF THE CHANNEL BOTTOM WIDTH AND EXTENDING DOWN TO THE INVERT ELEVATION. 5. USE GEOTEXTILE FABRIC TO SEAL GAPS BETWEEN LOGS. 6. PLACE TRANSPLANTS FROM TOE OF STREAMBANK TO TOP OF STREAMBANK. 7. TRANSPLANTS CAN BE SUBSTITUTED WITH LIVE STAKES AT THE DIRECTION OF THE ENGINEER.	



LOG VANE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
LOGS	TYPE: HARDWOOD SIZE: SEE NOTES. NUMBER OF HEADER LOGS: 1 NUMBER OF FOOTER LOGS: 1
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
STONE BACKFILL	CLASS A AND 57 STONE (50/50 MIX)
<b>NOTES FOR LOG VANE STRUCTURES:</b> 1. STRUCTURE DIMENSIONS AND STRUCTURE MEASUREMENTS ARE SHOWN ON THE STRUCTURE TABLES SHEET. 2. LOGS SHOULD BE STRAIGHT, HARDWOOD, AND NOT ROTTEN. 3. SOIL SHOULD BE COMPACTED WELL AROUND BURIED PORTIONS OF LOGS. 4. FILTER FABRIC SHOULD BE NAILED TO THE LOG BELOW THE BACKFILL. 5. LOGS 12 INCH DIAMETER MINIMUM.	



⊙ - ELEVATION POINT (SEE STRUCTURE TABLES)

**Permitted Plans**

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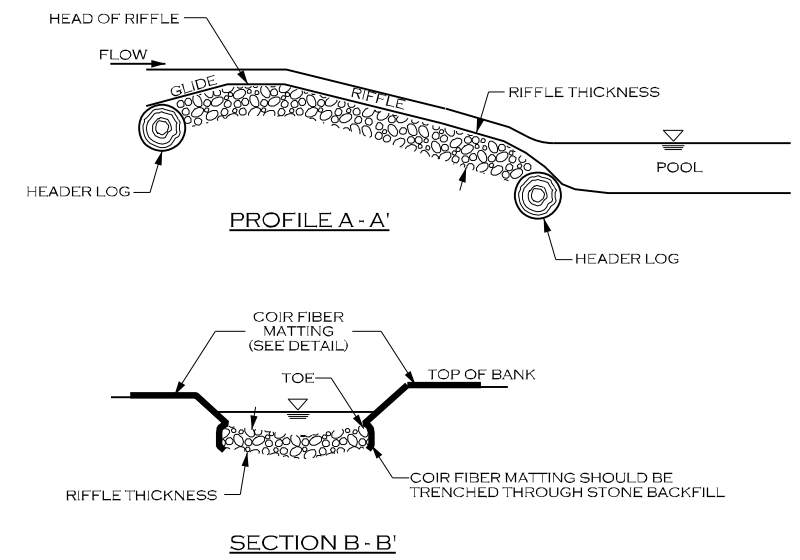
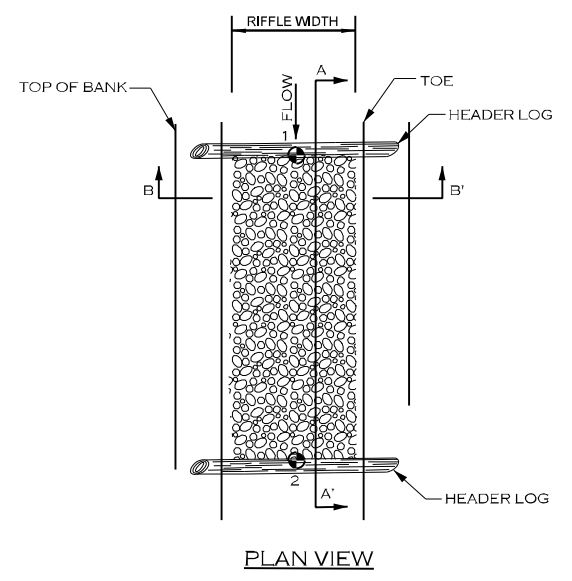
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DETAILS

CONSTRUCTED RIFFLE (CR)



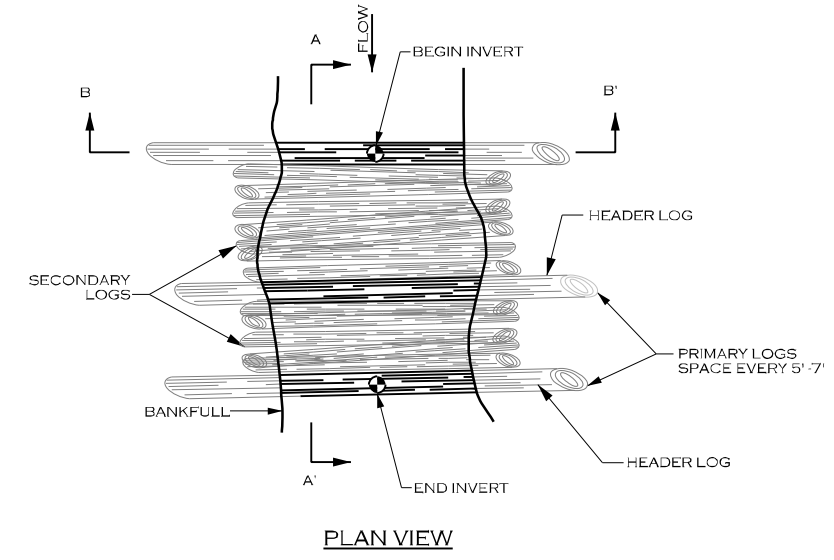
• ELEVATION POINT (SEE STRUCTURES TABLE)

CONSTRUCTED RIFFLE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
STONE BACKFILL	TYPE: GRANITE OR COMPARABLE SIZE: CLASS A AND CLASS B STONE (50/50 MIX) THICKNESS: 16 INCHES MIN.
COIR FIBER MATTING	SEE MATTING DETAIL

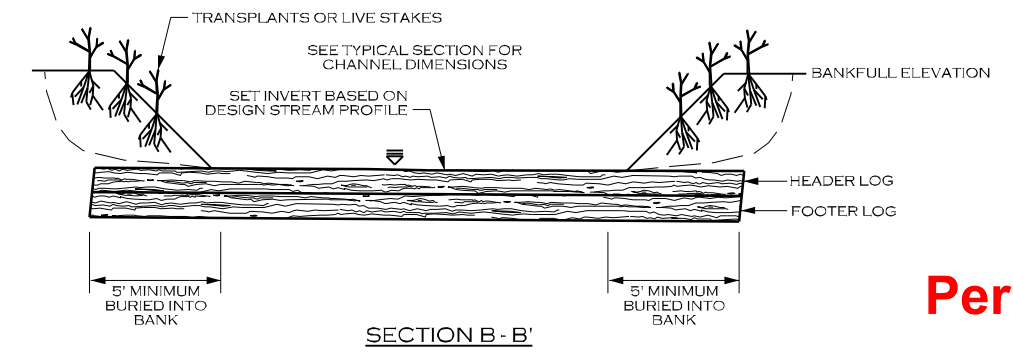
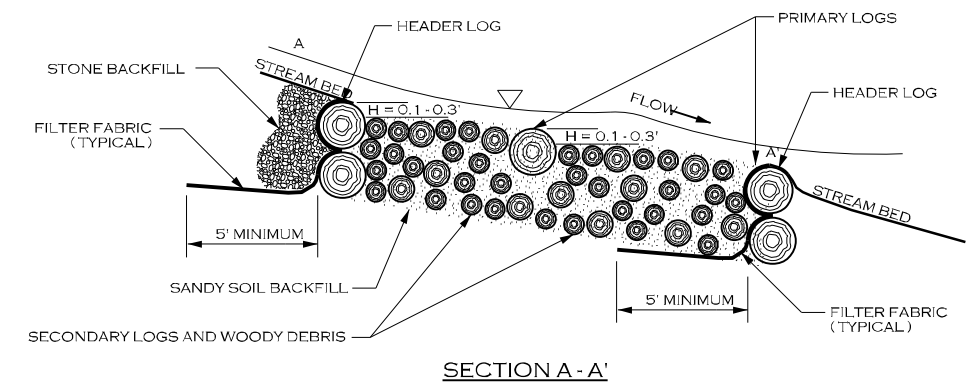
NOTES FOR CONSTRUCTED RIFFLE STRUCTURES:

- GRADE STREAMBED AND BANKS TO PROPOSED DIMENSIONS PER TYPICAL CROSS SECTION AND PROFILE.
- EXCAVATE TRENCH BELOW PROPOSED STREAMBED ELEVATION EQUAL TO OR GREATER THAN RIFFLE THICKNESS.
- INSTALL COIR FIBER MATTING ALONG STREAMBANKS ENSURING MATTING IS SUFFICIENTLY TRENCHED ALONG TOP OF BANK.
- FILL TRENCH WITH STONE TO FINAL DESIGN STREAM GRADE.

GRADE CONTROL WOODY RIFFLE (WR)



• ELEVATION POINT (SEE STRUCTURES TABLE)



- NOTES:
- PRIMARY LOGS SHOULD BE AT LEAST 10" OR MORE IN DIAMETER, RELATIVELY STRAIGHT, AND RECENTLY HARVESTED AND EXTENDING INTO THE BANK 5' ON EACH SIDE.
  - SECONDARY LOGS SHOULD BE AT LEAST 1" IN DIAMETER AND NO LARGER THAN 10", AND EXTEND INTO THE BANK 2 FEET ON EACH SIDE. WOOD MATERIAL SHALL BE VARYING DIAMETER TO ALLOW MATERIAL TO BE COMPACTED.
  - FILTER FABRIC SHOULD BE NAILED TO THE HEADER LOG BELOW THE BACKFILL.
  - ROOTWADS AND COIR FIBER MATTING CAN BE USED INSTEAD OF TRANSPLANTS OR LIVE STAKES, PER DIRECTION OF ENGINEER.
  - AFTER TRENCH HAS BEEN EXCAVATED A LAYER OF SECONDARY LOGS AND WOODY DEBRIS SHOULD BE PLACED WITH MINIMAL GAPS. A LAYER OF ON-SITE ALLUVIUM SHOULD BE APPLIED TO FILL VOIDS BETWEEN SECONDARY LOGS BEFORE ADDITIONAL LAYERS ARE PLACED.

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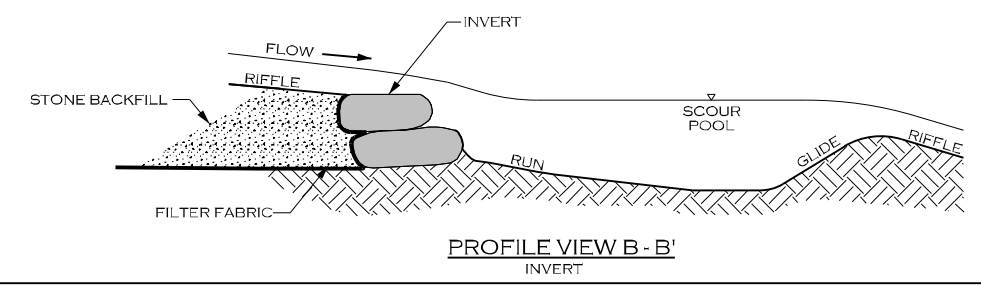
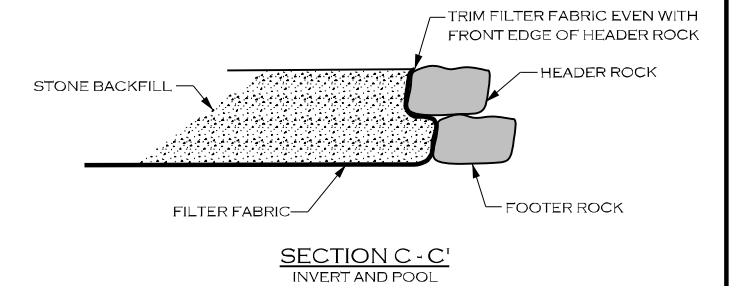
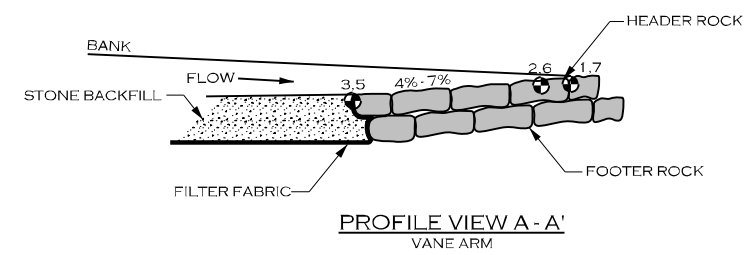
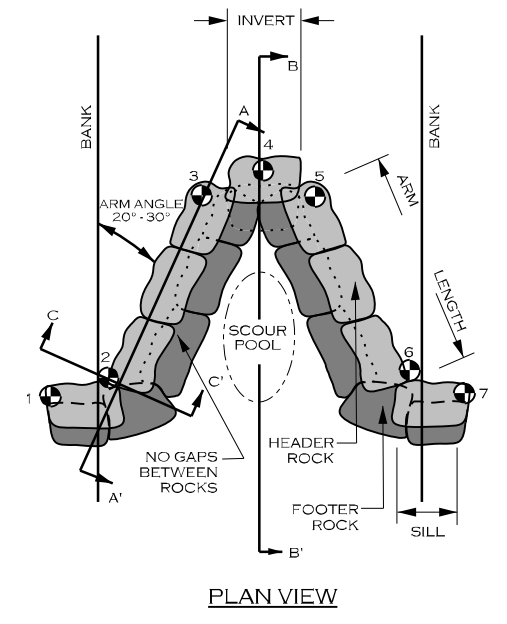
DETAILS

⊙ - ELEVATION POINT (SEE STRUCTURE TABLES)

ROCK CROSS VANE SPECIFICATIONS		
MATERIALS:	SPECIFICATIONS:	
BOULDER	TYPE: GRANITE OR COMPARABLE SIZE: 3 x 2 x 2 FT NUMBER OF HEADER ROWS: 1 NUMBER OF FOOTER ROWS: 1	
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM	
STONE BACKFILL	CLASS A AND 57 STONE (50/50 MIX)	

**NOTES FOR CROSS VANE STRUCTURES:**

- STRUCTURE DIMENSIONS AND MEASUREMENTS ARE SHOWN ON THE STRUCTURE TABLES.
- DIG A TRENCH BELOW THE STREAM BED FOR FOOTER AND HEADER ROCKS, FILTER FABRIC AND STONE BACKFILL.
- PLACE FOOTER ROCKS AND THEN HEADER ROCKS TO ACHIEVE DESIGN DIMENSIONS AND ELEVATIONS.
- USE HAND PLACED STONE TO FILL GAPS AND VOIDS ON UPSTREAM SIDE OF THE HEADER AND FOOTER ROCKS.
- PLACE FILTER FABRIC BEGINNING AT THE TOP OF THE FOOTER ROCKS AND EXTENDING DOWN TO THE DEPTH OF THE FOOTER ROCKS, THEN OUTWARD THE DISTANCE SPECIFIED ABOVE (FILTER FABRIC WIDTH UPSTREAM).
- INSTALL STONE BACKFILL OVER FILTER FABRIC AS SHOWN.
- AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ONSITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.

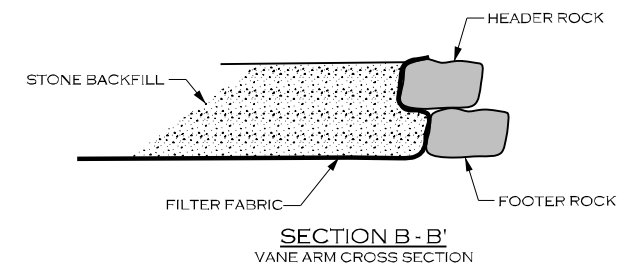
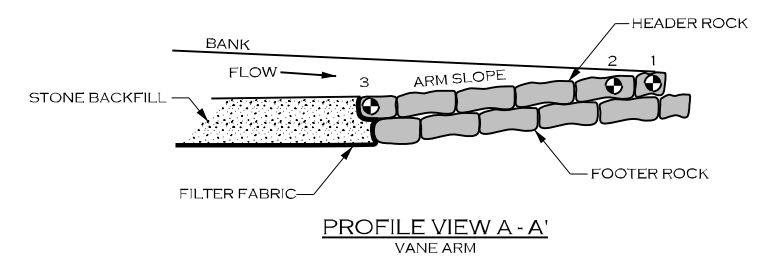
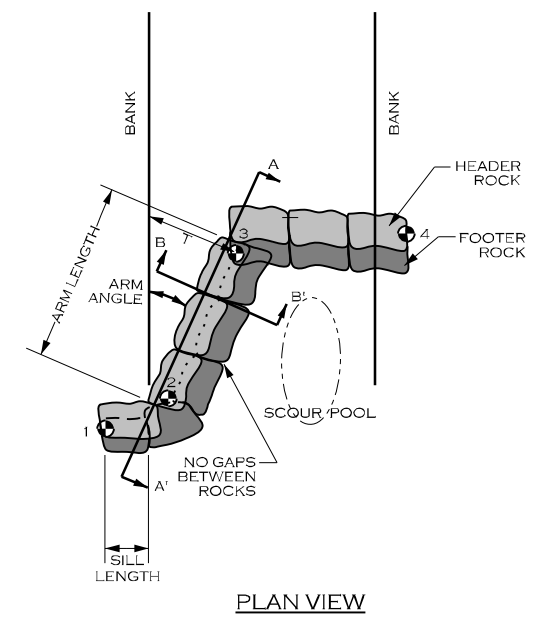


GRADE CONTROL J-HOOK VANE (RJH)

GRADE CONTROL J-HOOK VANE SPECIFICATIONS		
MATERIALS:	SPECIFICATIONS:	
BOULDER	TYPE: GRANITE OR COMPARABLE SIZE: 3 x 2 x 2 FT NUMBER OF HEADER ROWS: 1 NUMBER OF FOOTER ROWS: 1	
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM	
STONE BACKFILL	CLASS A AND 57 STONE (50/50 MIX)	

**NOTES FOR GRADE CONTROL J-HOOK VANE:**

- STRUCTURE DIMENSIONS AND MEASUREMENTS ARE SHOWN ON THE STRUCTURES TABLE SHEET.
- INSTALL FILTER FABRIC BEGINNING AT THE TOP OF THE HEADER ROCKS AND EXTEND DOWNWARD TO THE DEPTH OF THE BOTTOM FOOTER ROCK, AND THEN UPSTREAM TO A MINIMUM OF TEN FEET.
- DIG A TRENCH BELOW THE BED FOR FOOTER ROCKS AND PLACE FILL ON UPSTREAM SIDE OF VANE ARM, BETWEEN THE ARM AND STREAMBANK.
- START AT BANK AND PLACE FOOTER ROCKS FIRST AND THEN HEADER (TOP) ROCK.
- USE HAND PLACED STONE TO FILL GAPS ON UPSTREAM SIDE OF HEADER AND FOOTER ROCKS.
- INSTALL STONE BACKFILL AS SHOWN, TO THE DIMENSIONS INDICATED IN THE STRUCTURES TABLE SHEET.
- AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ONSITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.



⊙ - ELEVATION POINT (SEE STRUCTURES TABLE)

Permitted Plans

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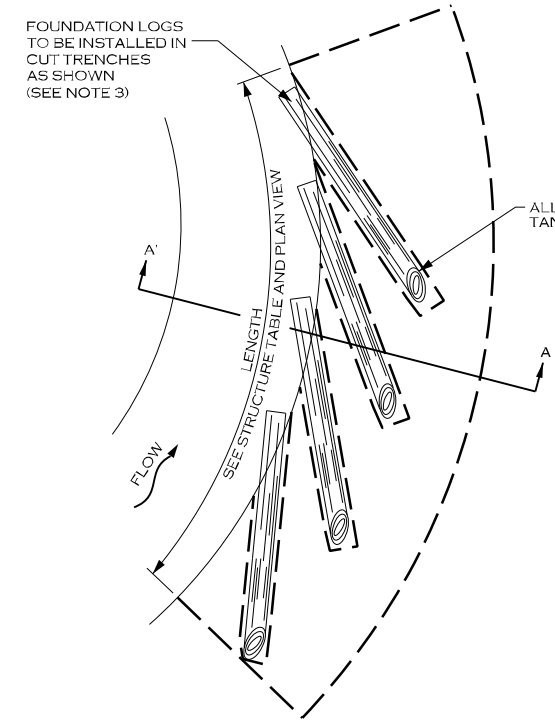
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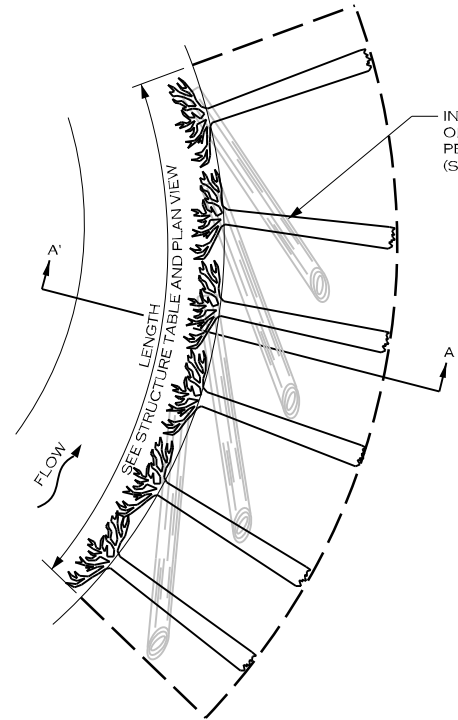
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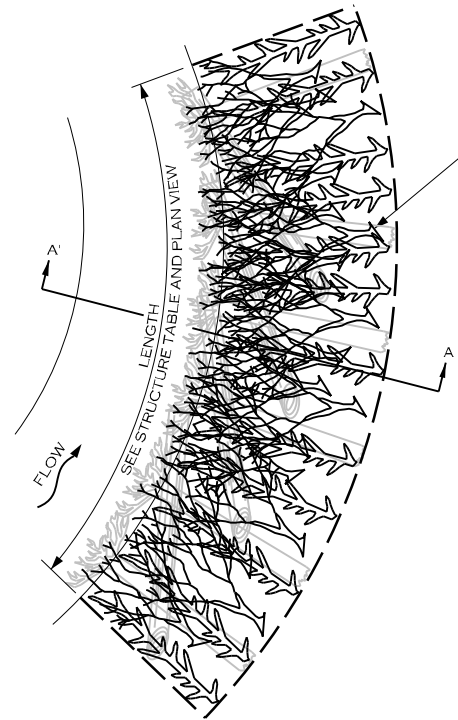
TOE WOOD WITH GEOLIFT <sup>(TW)</sup>



PLAN VIEW - 1  
FOUNDATION LOG INSTALLATION



PLAN VIEW - 2  
ROOTWAD INSTALLATION

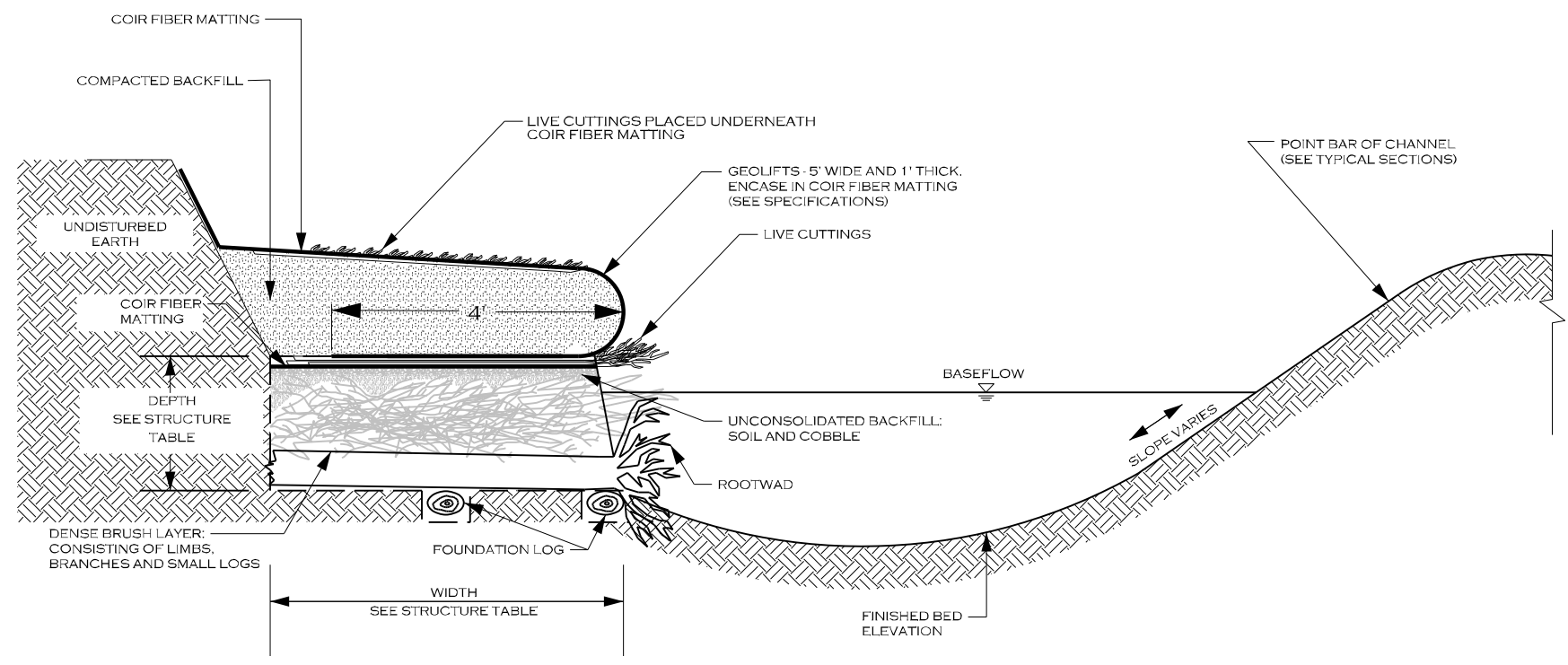


PLAN VIEW - 3  
BRUSH LAYER INSTALLATION

Permitted Plans

TOE WOOD SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
BRUSH MATERIAL	TYPE: BRUSH MATERIAL SIZE: 5 FT LONG, 1 INCH DIAMETER
ROOTWAD MATERIAL	TYPE: HARDWOOD SIZE: 6 FT - 10 FT LONG MIN, 12 INCH DIAMETER
FOUNDATION LOGS	TYPE: HARDWOOD SIZE: 6 FT - 10 FT LONG MIN, 12 INCH DIAMETER
COIR FIBER MATTING	TYPE: NETTING (SEE SPECIFICATIONS)

- NOTES FOR TOE WOOD STRUCTURES:**
- DIG A TRENCH ALONG BANK WHERE TOE WOOD IS TO BE INSTALLED, TO THE DEPTH AND WIDTH SPECIFIED IN THE DETAILS AND STRUCTURE TABLE. IF TOE WOOD IS BEING PLACED IN A LOCATION WHERE THERE IS NOT EXISTING GROUND, PLACE FILL MATERIAL AND COMPACT TO FORM THE TRENCH FOR THE TOE WOOD MATERIALS.
  - FOUNDATION LOGS SHALL MEET THE MINIMUM DIAMETER LISTED ABOVE, AND BE STRAIGHT, HARDWOOD, AND NOT ROTTEN. EXCAVATE TRENCH BELOW TOEWOOD GRADE FOR FOUNDATION LOG INSTALLATION. PLACE FOUNDATION LOGS AS SHOWN IN THE PLAN VIEW 1 TO FORM A FOUNDATION FOR THE TOE WOOD MATERIALS TO LAY UPON. THE ANGLE BETWEEN THE TANGENT LINE OF THE BANK AND THE UPSTREAM FACE OF THE FOUNDATION LOG SHALL BE BETWEEN 20 TO 30 DEGREES.
  - INSTALL ROOTWADS ON TOP OF FOUNDATION LOGS, PERPENDICULAR TO THE FLOW AS SHOWN IN PLAN VIEW 2.
  - INSTALL BRUSH MATERIAL, INCLUDING BRANCHES, LOGS, AND BRUSH, AND AT LEAST 1" IN DIAMETER. LARGE MATERIALS AND SMALL MATERIALS SHALL BE MIXED, PLACED IN LAYERS NO MORE THAN 1 FOOT DEEP, COVERED IN A THIN LAYER OF ONSITE ALLUVIUM, AND COMPACTED BEFORE PLACING THE NEXT LAYER OF TOE WOOD MATERIAL. CONTINUE PLACING MATERIALS TO FORM A DENSE LAYER OF WOODY MATERIALS AND ONSITE ALLUVIUM TO THE DEPTH AND ELEVATIONS SPECIFIED (PLAN VIEW 3).
  - PLACE AN UNCONSOLIDATED LAYER OF SOIL AND COBBLE ON TOP OF BRUSH LAYER.
  - COVER SOIL AND COBBLE LAYER IN COIR FIBER MATTING.
  - INSTALL LIVE CUTTINGS, INCLUDING BRANCHES AND BRUSH, AT LEAST 5 FEET IN LENGTH, AND AT LEAST 1 INCH IN DIAMETER.
  - CONSTRUCT GEOLIFTS OR PLACE TRANSPLANTS (AS SPECIFIED OR DIRECTED BY THE ENGINEER) TO REBUILD THE STREAMBANK ABOVE THE TOE WOOD LAYER.



SECTION VIEW

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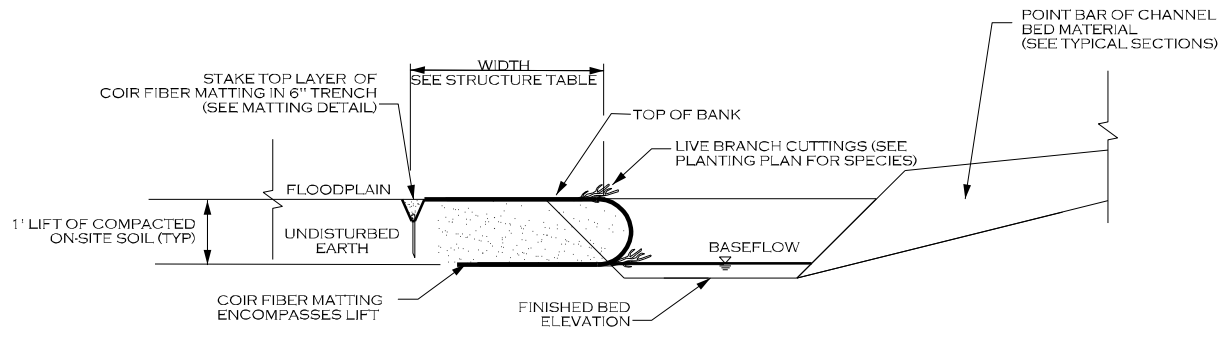
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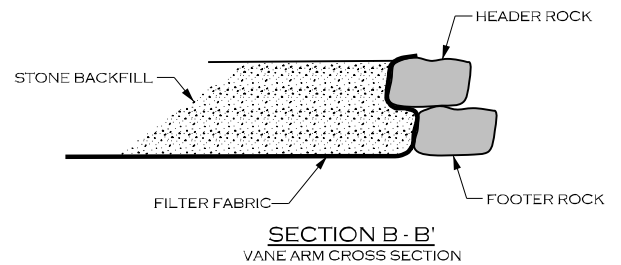
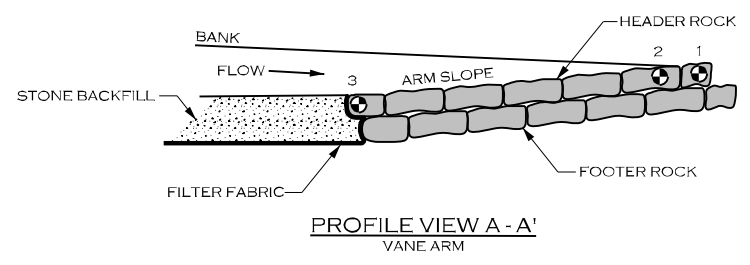
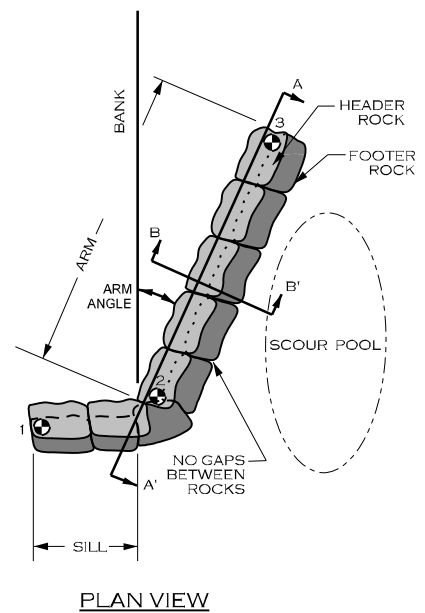
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ROCK VANE (RV)



Permitted Plans

ROCK VANE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
BOULDER	TYPE: GRANITE OR COMPARABLE SIZE: 3 FT X 2 FT X 2 FT NUMBER OF HEADER ROWS: 1 NUMBER OF FOOTER ROWS: 1
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
<p><b>NOTES FOR ROCK VANE STRUCTURES:</b></p> <ol style="list-style-type: none"> <li>STRUCTURE DIMENSIONS AND MEASUREMENTS ARE SHOWN ON THE STRUCTURES TABLE SHEET.</li> <li>DIG A TRENCH BELOW THE STREAM BED FOR FOOTER AND HEADER ROCKS, FILTER FABRIC AND STONE BACKFILL.</li> <li>PLACE FOOTER ROCKS AND THEN HEADER ROCKS TO ACHIEVE DESIGN DIMENSIONS AND ELEVATIONS.</li> <li>USE HAND PLACED STONE TO FILL GAPS AND VOIDS ON UPSTREAM SIDE OF THE HEADER AND FOOTER ROCKS.</li> <li>PLACE FILTER FABRIC BEGINNING AT THE TOP OF THE HEADER ROCKS AND EXTENDING DOWN TO THE DEPTH OF THE FOOTER ROCKS, THEN OUTWARD THE DISTANCE SPECIFIED IN THE STRUCTURES TABLE SHEET.</li> <li>INSTALL STONE BACKFILL AND ONSITE ALLUVIUM AS SHOWN, TO THE DIMENSIONS INDICATED IN THE STRUCTURES TABLE SHEET.</li> <li>AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ONSITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.</li> </ol>	

• ELEVATION POINT (SEE STRUCTURES TABLE)

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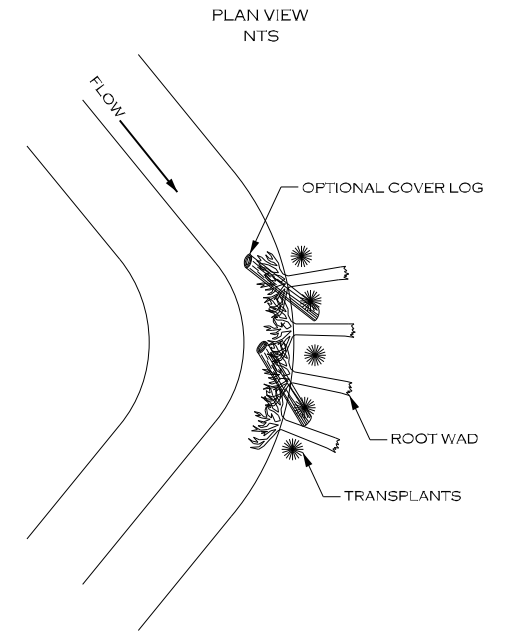
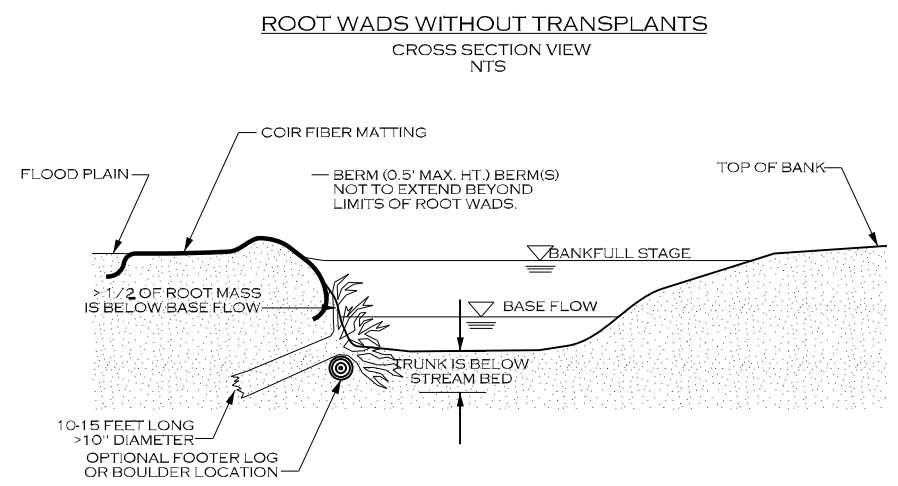
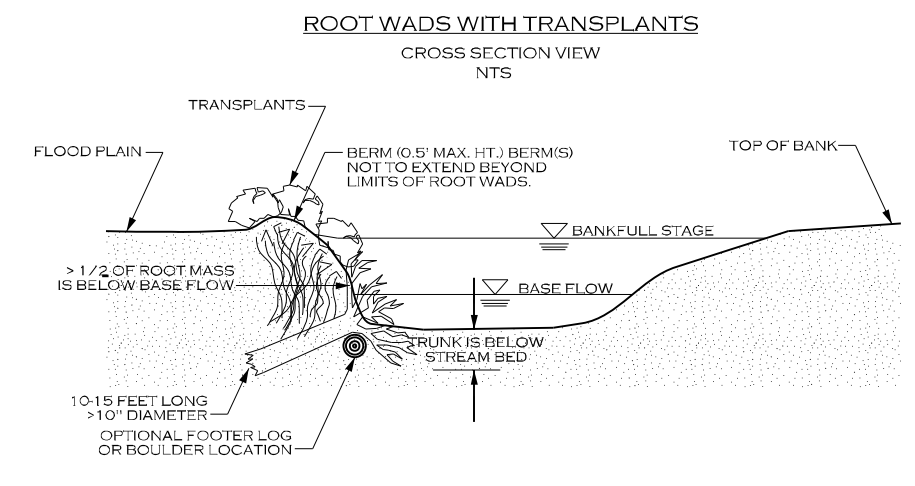
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DETAILS

ROOTWAD (RW)



NOTES:

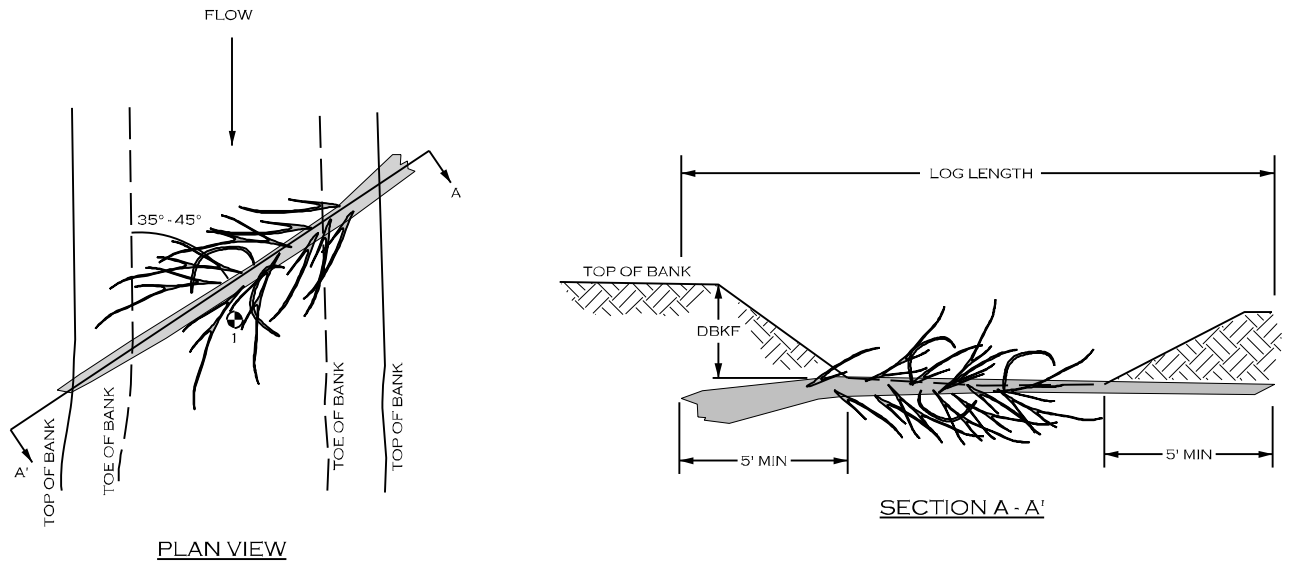
TRENCHING METHOD:  
IF THE ROOT WAD CANNOT BE DRIVEN INTO THE BANK OR THE BANK NEEDS TO BE RECONSTRUCTED, THE TRENCHING METHOD SHOULD BE USED. THIS METHOD REQUIRES THAT A TRENCH BE EXCAVATED FOR THE LOG PORTION OF THE ROOT WAD. IN THIS CASE, A FOOTER LOG SHOULD BE INSTALLED UNDERNEATH THE ROOT WAD IN A TRENCH EXCAVATED PARALLEL TO THE BANK AND WELL BELOW THE STREAMBED. ONE-THIRD OF THE ROOT WAD SHOULD REMAIN BELOW NORMAL BASE FLOW CONDITIONS.

NOTES:

DRIVE POINT METHOD:  
SHARPEN THE END OF THE LOG WITH A CHAINSAW BEFORE "DRIVING" IT INTO THE BANK. ORIENT ROOT WADS AS SHOWN, DEFLECTING THE WATER AWAY FROM THE BANK. A TRANSPLANT SHOULD BE PLACED ON THE DOWNSTREAM SIDE OF THE ROOT WAD IF A BACK EDDY IS FORMED BY THE ROOT WAD.

Permitted Plans

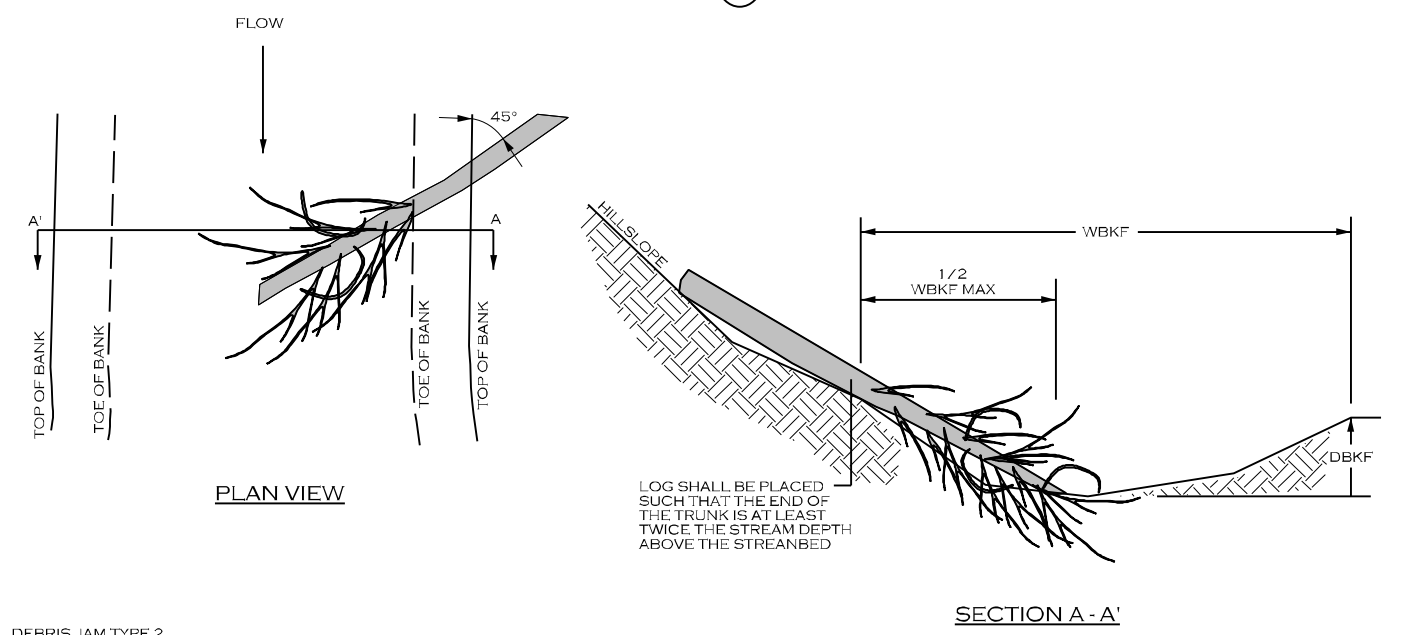
DEBRIS JAM TYPE 1 (DJ T-1)



DEBRIS JAM TYPE 1

1. DEBRIS JAM TYPE 1 INSTALLATIONS SHALL BE PLACED WITHIN STREAM RIFFLES TO TRAP DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH FLOWING, AERATED WATER.
2. TREE SHALL BE ANY NON-EVERGREEN TREE WITH BRANCHES, AT LEAST 8 INCHES DIAMETER, AND NOT ROTTEN.
3. TREE SHALL HAVE CONSIDERABLE NUMBER OF BRANCHES THAT REMAIN EXPOSED AFTER INSTALLATION AND IN CONTACT WITH THE STREAM FLOW TO TRAP LEAVES AND DETRITUS FROM STREAM FLOW.
4. TREE SHALL BE INSTALLED SO THAT THE TRUNK IS LEVEL WITH THE BED ELEVATION OF THE STREAM, SUCH THAT THE TRUNK DOES NOT POOL WATER IN FRONT OF THE STRUCTURE. BACKFILL AND COMPACT AROUND THE TRUNK AND INSTALLED TREE TO MINIMIZE VOIDS.

DEBRIS JAM TYPE 2 (DJ T-2)



DEBRIS JAM TYPE 2

1. DEBRIS JAM TYPE 2 INSTALLATIONS SHALL BE PLACED AREAS WHERE THE STREAM FLOWS AGAINST A STEEP SLOPE. A TREE IS INSTALLED AS SHOWN TO CATCH DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH STREAM FLOWS. THIS DEBRIS JAM MAY BE INSTALLED IN RIFFLE OR POOL LOCATIONS.
2. TREE SHALL BE ANY NON-EVERGREEN TREE WITH BRANCHES, AT LEAST 8 INCHES DIAMETER, AND NOT ROTTEN.
3. TREE SHALL HAVE CONSIDERABLE NUMBER OF BRANCHES THAT REMAIN EXPOSED AND IN CONTACT WITH THE STREAM FLOW AFTER INSTALLATION TO TRAP LEAVES AND DETRITUS FROM STREAM FLOW.
4. TREE SHALL BE INSTALLED SO THAT THE TRUNK LIES UPON THE HILL SLOPE, AND IS ANCHORED TO THE HILLSLOPE TO PREVENT MOVEMENT DURING LARGE STREAM FLOWS. TREE SHALL BE CABLED TO A FRESHLY CUT STUMP OR ANOTHER LIVE TREE OF AT LEAST THE SAME SIZE.

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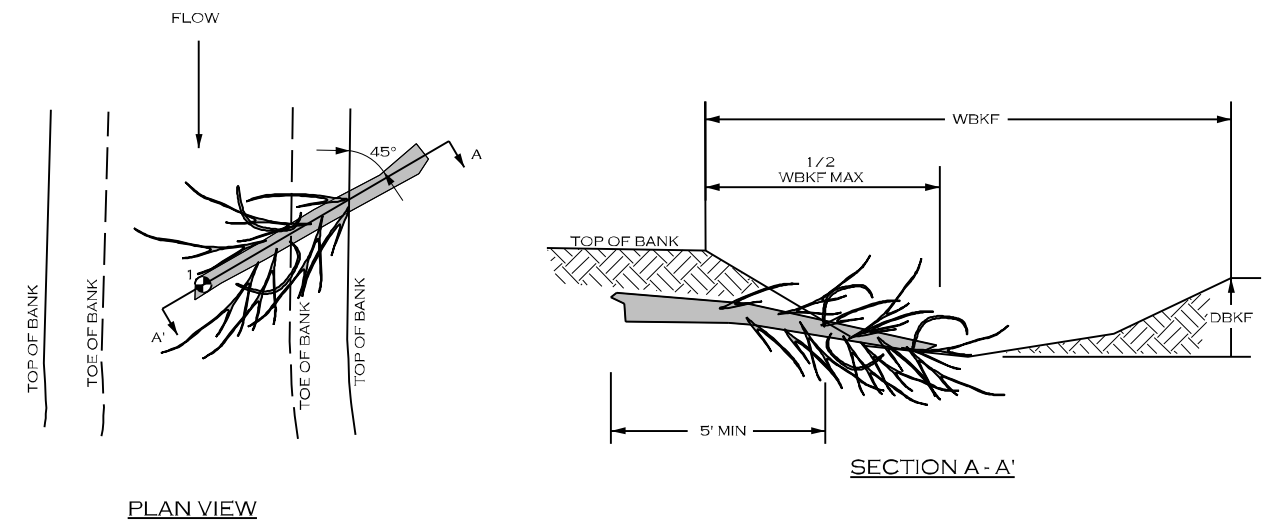
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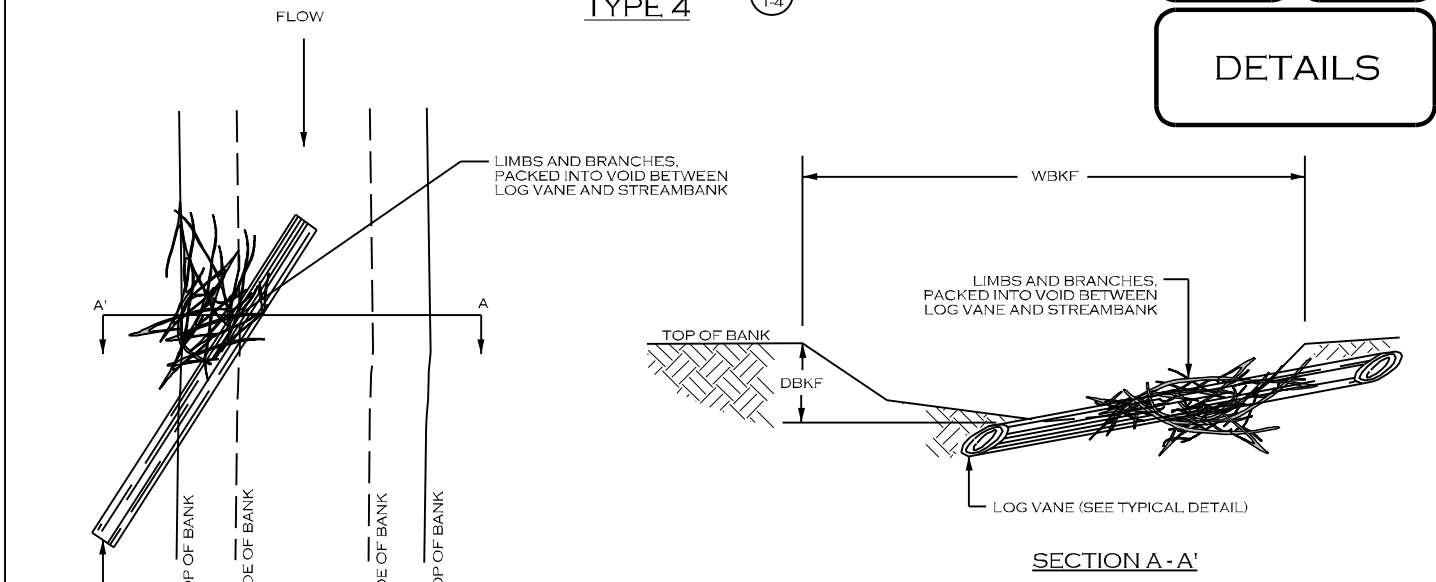
DEBRIS JAM TYPE 3 (DJ T-3)



DEBRIS JAM TYPE 3

1. DEBRIS JAM TYPE 3 INSTALLATIONS SHALL BE PLACED WITHIN STREAM RIFFLES OR POOLS TO TRAP DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH FLOWING WATER.
2. TREE SHALL BE ANY NON-EVERGREEN TREE WITH BRANCHES, AT LEAST 8 INCHES DIAMETER, AND NOT ROTTEN.
3. TREE SHALL HAVE CONSIDERABLE NUMBER OF BRANCHES THAT REMAIN EXPOSED AFTER INSTALLATION AND IN CONTACT WITH THE STREAM FLOW TO TRAP LEAVES AND DETRITUS FROM STREAM FLOW.
4. TREE SHALL BE INSTALLED SO THAT THE TRUNK IS IN CONTACT WITH THE STREAM BED, BACKFILL AND COMPACT AROUND THE TRUNK AND INSTALLED TREE TO MINIMIZE VOIDS.

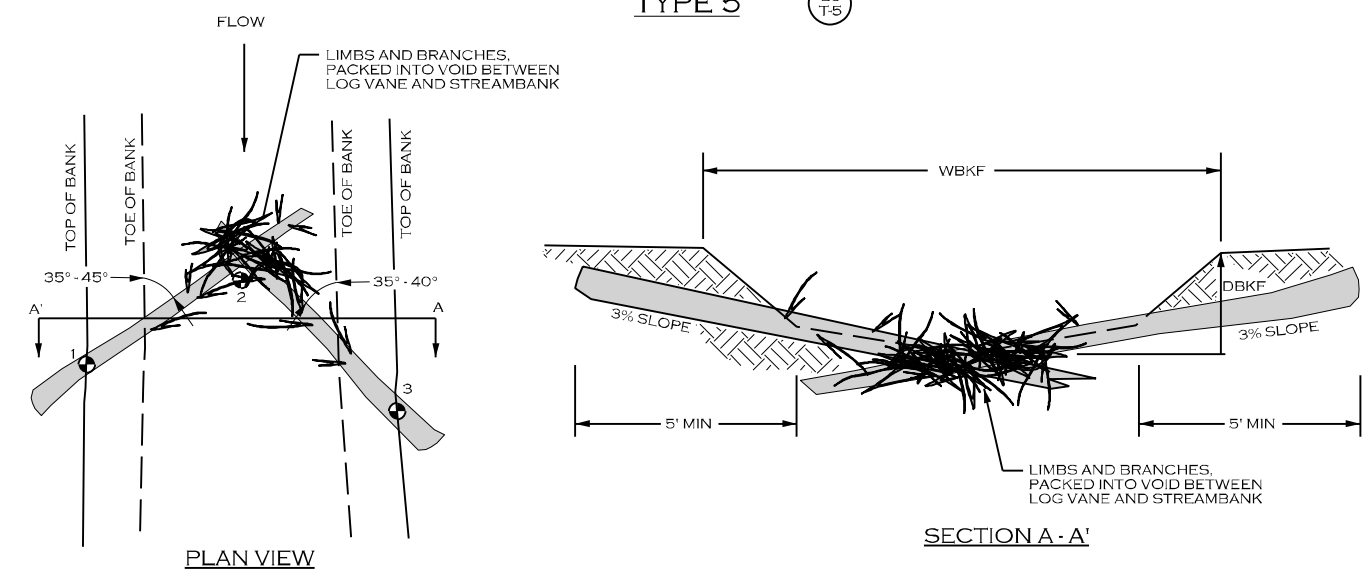
DEBRIS JAM TYPE 4 (DJ T-4)



DEBRIS JAM TYPE 4

1. DEBRIS JAM TYPE 4 INSTALLATIONS SHALL BE INSTALLED IN ASSOCIATION WITH LOG VANE INSTALLATIONS (SEE TYPICAL DETAIL FOR LOG VANE).
2. LIMBS AND BRANCHES THAT FORM THE DEBRIS JAM SHALL VARY IN DIAMETER, BUT SHALL BE AT LEAST 3 FEET LONG WITH MULTIPLE BRANCHES TO PROMOTE ENTANGLING WHEN PACKED TOGETHER. LIMBS AND BRANCHES SHOULD BE A MIXTURE (APPROX. 50/50) OF RECENTLY CUT BRANCHES AND DEAD/DECAYING BRANCHES.
3. PREPARE THE EXCAVATION FOR THE LOG VANE, THEN PLACE THE DEBRIS JAM PRIOR TO PLACING AND INSTALLING THE LOG VANE.
4. WHEN INSTALLED, THE LOG VANE SHOULD PIN THE DEBRIS JAM TO THE STREAM BED AND BANK AND PREVENT EASY MOVEMENT DURING HIGH FLOW EVENTS.
5. AFTER INSTALLATION, STREAM FLOW SHOULD BE IN CONTACT WITH THE DEBRIS JAM, IN ORDER TO TRAP ADDITIONAL DEBRIS AND ORGANIC MATTER.

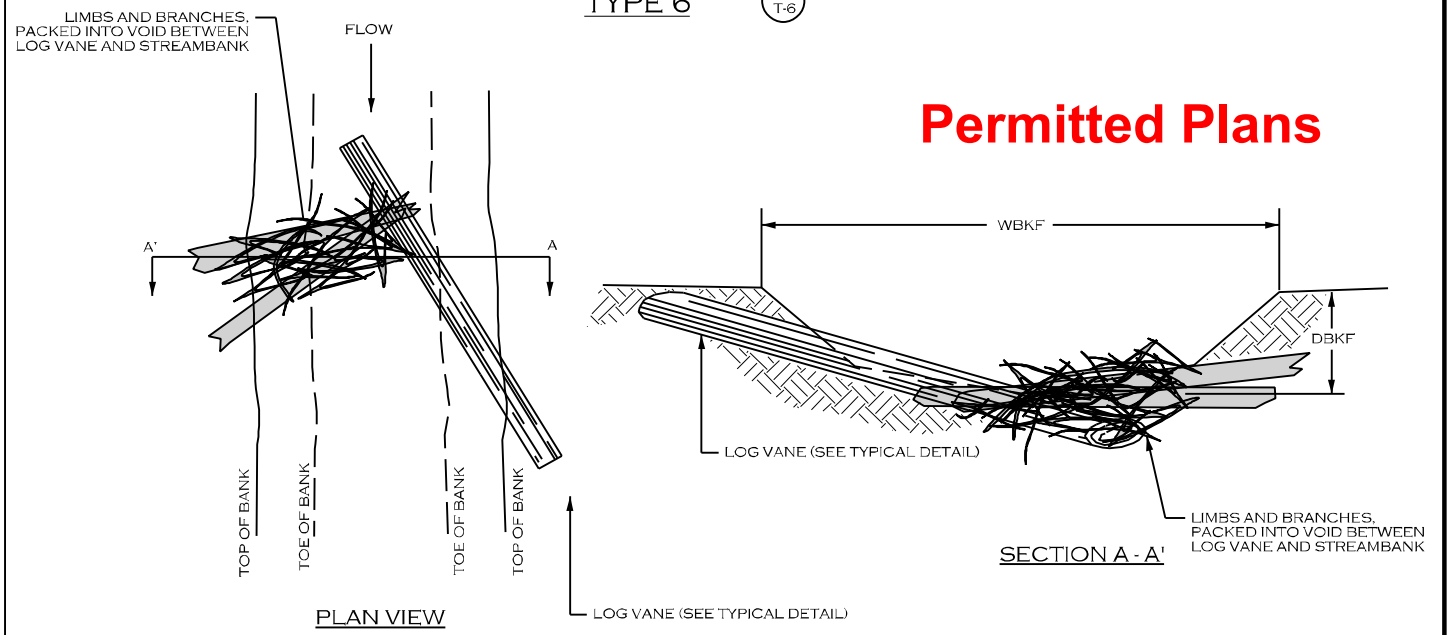
DEBRIS JAM TYPE 5 (DJ T-5)



DEBRIS JAM TYPE 5

1. DEBRIS JAM TYPE 5 INSTALLATIONS SHALL BE PLACED WITHIN STREAM RIFFLES TO TRAP DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH FLOWING, AERATED WATER.
2. LIMBS AND BRANCHES THAT FORM THE DEBRIS JAM SHALL VARY IN DIAMETER, BUT SHALL BE AT LEAST 3 FEET LONG WITH MULTIPLE BRANCHES TO PROMOTE ENTANGLING WHEN PACKED TOGETHER. LIMBS AND BRANCHES SHOULD BE A MIXTURE (APPROX. 50/50) OF RECENTLY CUT BRANCHES AND DEAD/DECAYING BRANCHES.
3. THE INVERT/CENTER OF THE STRUCTURE SHALL BE INSTALLED AT THE STREAM BED ELEVATION, SUCH THAT WATER IS NOT POOLED IN FRONT OF THE STRUCTURE.
4. PREPARE THE EXCAVATION FOR THE TWO LARGER LOGS, THEN PLACE THE DEBRIS JAM PRIOR TO PLACING AND INSTALLING THE TWO LARGER LOGS.
5. WHEN INSTALLED, THE LARGER LOGS SHOULD PIN THE DEBRIS JAM TO THE STREAM BED AND PREVENT EASY MOVEMENT DURING HIGH FLOW EVENTS. SMALL BOULDERS CAN BE USED TO PIN THE LARGER LOGS IN POSITION TO PREVENT MOVEMENT DURING STORM FLOWS.
6. AFTER INSTALLATION, STREAM FLOW SHOULD BE IN CONTACT WITH THE DEBRIS JAM, IN ORDER TO TRAP ADDITIONAL DEBRIS AND ORGANIC MATTER.

DEBRIS JAM TYPE 6 (DJ T-6)



DEBRIS JAM TYPE 6

1. DEBRIS JAM TYPE 6 INSTALLATIONS SHALL BE PLACED IN ASSOCIATION WITH LOG VANES TO TRAP DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH FLOWING, AERATED WATER.
2. LIMBS AND BRANCHES THAT FORM THE DEBRIS JAM SHALL VARY IN DIAMETER, BUT SHALL BE AT LEAST 3 FEET LONG WITH MULTIPLE BRANCHES TO PROMOTE ENTANGLING WHEN PACKED TOGETHER. SMALL LOGS INCORPORATED INTO THE DEBRIS JAM SHALL BE LONG ENOUGH TO BE PINNED INTO PLACE BY THE LOG VANE AND BURIED INTO THE ADJACENT BANK. LIMBS, BRANCHES, AND SMALL LOGS SHOULD BE A MIXTURE (APPROX. 50/50) OF RECENTLY CUT BRANCHES AND DEAD/DECAYING BRANCHES.
3. THE INVERT/CENTER OF THE STRUCTURE SHALL BE INSTALLED AT THE STREAM BED ELEVATION, SUCH THAT WATER IS NOT POOLED IN FRONT OF THE STRUCTURE. AFTER COMPLETION, MOST STREAM FLOW SHOULD FLOW OVER THE LOG VANE AND BE CENTERED NEAR THE MIDDLE OF THE CHANNEL.

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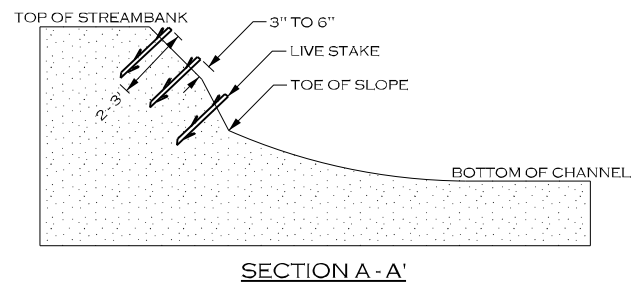
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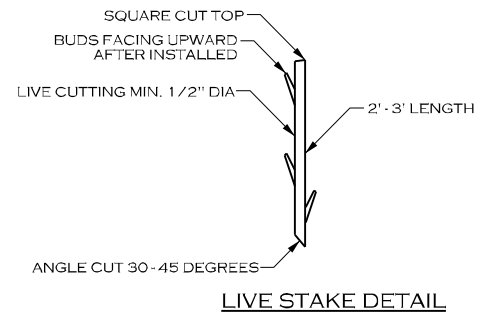
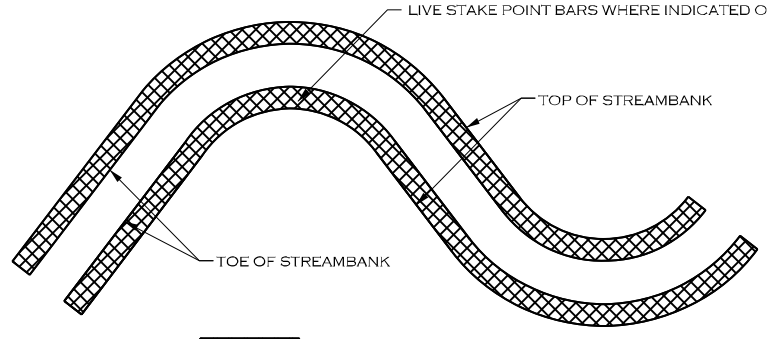
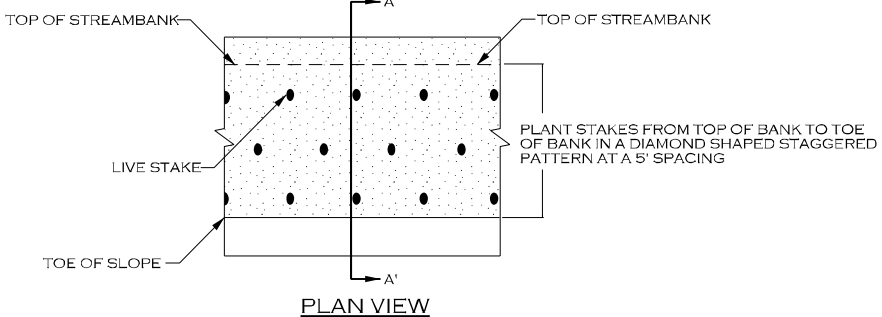
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**LIVE STAKING**

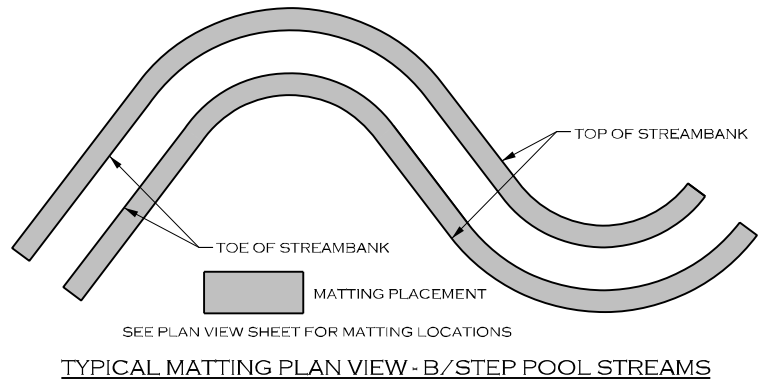
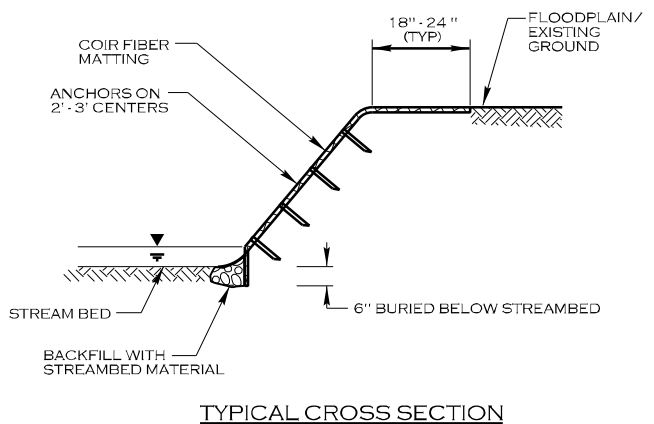
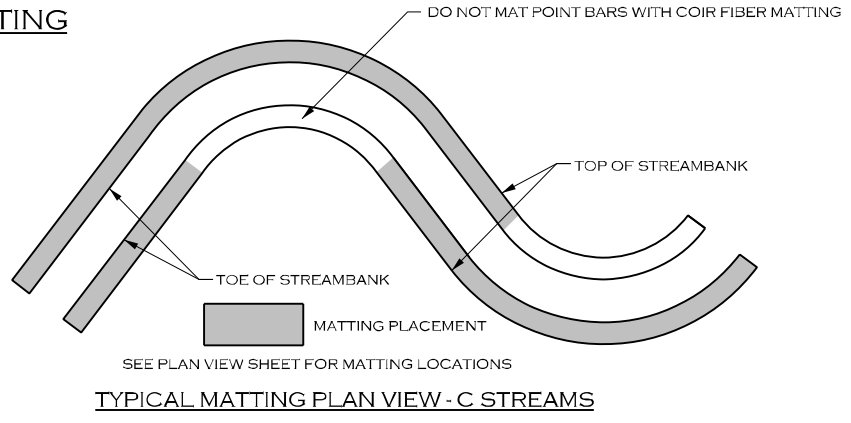
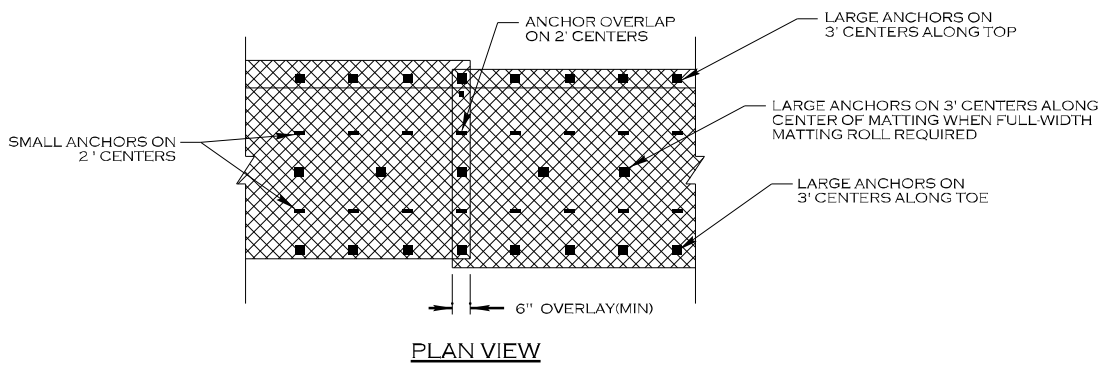


**NOTES:**

1. IF STAKES ARE BEING HARVESTED NEAR THE SITE, STAKES SHOULD BE CUT AND INSTALLED ON THE SAME DAY.
2. KEEP STAKES COOL AND MOIST WHILE ON THE JOB SITE AND PRIOR TO INSTALLATION.
3. DO NOT INSTALL STAKES THAT HAVE BEEN SPLIT.
4. STAKES MUST BE INSTALLED WITH BUDS POINTING UPWARDS.
5. STAKES SHALL BE INSTALLED PERPENDICULAR TO BANK.
6. STAKES SHALL BE 1/2 TO 2 INCHES IN DIAMETER AND 2 TO 3 FT LONG.
7. STAKES SHALL BE INSTALLED LEAVING 1/5 OF STAKE ABOVE GROUND.

SEE PLAN VIEW SHEET FOR LIVE STAKING LOCATIONS  
**TYPICAL LIVE STAKING AREA PLAN VIEW**

**COIR FIBER MATTING**

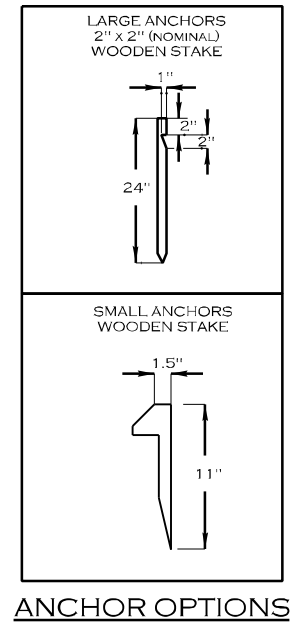


**NOTES:**

1. IN AREAS TO BE MATTED, ALL SEEDING, SOIL AMENDMENTS, AND SOIL PREPARATION MUST BE COMPLETED PRIOR TO PLACEMENT OF COIR FIBER MATTING.
2. WOODEN STAKES ARE PREFERRED. USE OF STAPLES AS SMALL ANCHORS MUST BE PRE-APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.

**TYPICAL CROSS SECTION**

**TYPICAL MATTING PLAN VIEW - B/STEP POOL STREAMS**



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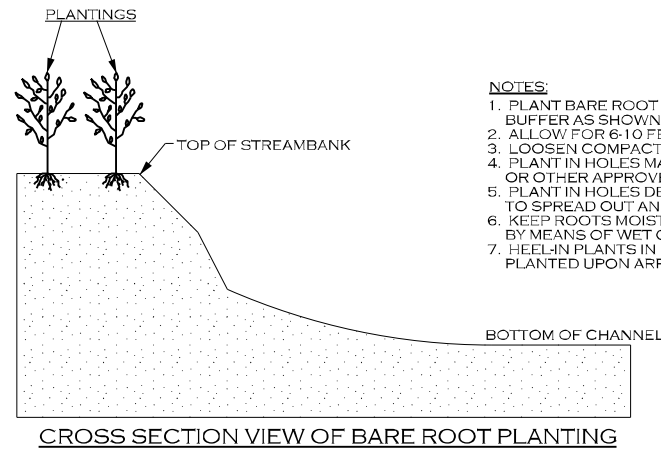
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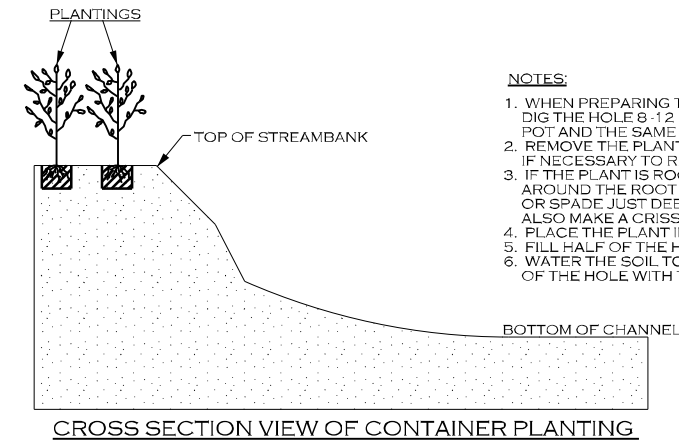
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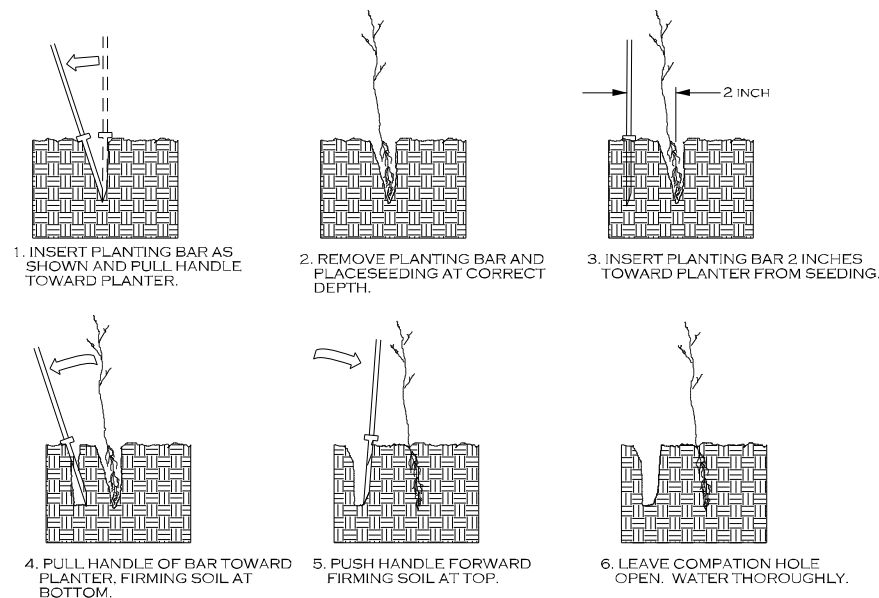
- NOTES:**
1. PLANT BARE ROOT SHRUBS AND TREES TO THE WIDTH OF THE BUFFER AS SHOWN ON THE PLANS.
  2. ALLOW FOR 6-10 FEET BETWEEN PLANTINGS, DEPENDING ON SIZE.
  3. LOOSEN COMPACTED SOIL.
  4. PLANT IN HOLES MADE BY A MATTOCK, DIBBLE, PLANTING BAR, OR OTHER APPROVED MEANS.
  5. PLANT IN HOLES DEEP AND WIDE ENOUGH TO ALLOW THE ROOTS TO SPREAD OUT AND DOWN WITHOUT J-ROOTING.
  6. KEEP ROOTS MOIST WHILE DISTRIBUTING OR WAITING TO PLANT BY MEANS OF WET CANVAS, BURLAP, OR STRAW.
  7. HEEL-IN PLANTS IN MOIST SOIL OR SAWDUST IF NOT PROMPTLY PLANTED UPON ARRIVAL TO PROJECT SITE.



- NOTES:**
1. WHEN PREPARING THE HOLE FOR A POTTED PLANT OR SHRUB DIG THE HOLE 8-12 INCHES LARGER THAN THE DIAMETER OF THE POT AND THE SAME DEPTH AS THE POT.
  2. REMOVE THE PLANT FROM THE POT. LAY THE PLANT ON ITS SIDE IF NECESSARY TO REMOVE THE POT.
  3. IF THE PLANT IS ROOTBOUND (ROOTS GROWING IN A SPIRAL AROUND THE ROOT BALL), MAKE VERTICAL CUTS WITH A KNIFE OR SPADE JUST DEEP ENOUGH TO CUT THE NET OF ROOTS. ALSO MAKE A CRISS-CROSS CUT ACROSS THE BOTTOM OF THE BALL.
  4. PLACE THE PLANT IN THE HOLE.
  5. FILL HALF OF THE HOLE WITH SOIL (SAME SOIL REMOVED FOR BACKFILL).
  6. WATER THE SOIL TO REMOVE AIR POCKETS AND FILL THE REST OF THE HOLE WITH THE REMAINING SOIL.

**Permitted Plans**

**DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR**



**PLANTING NOTES:**

**PLANTING BAG**

DURING PLANTING, SEEDLINGS SHALL BE KEPT IN A MOIST CANVAS BAG OR SIMILAR CONTAINER TO PREVENT THE ROOT SYSTEMS FROM DRYING.

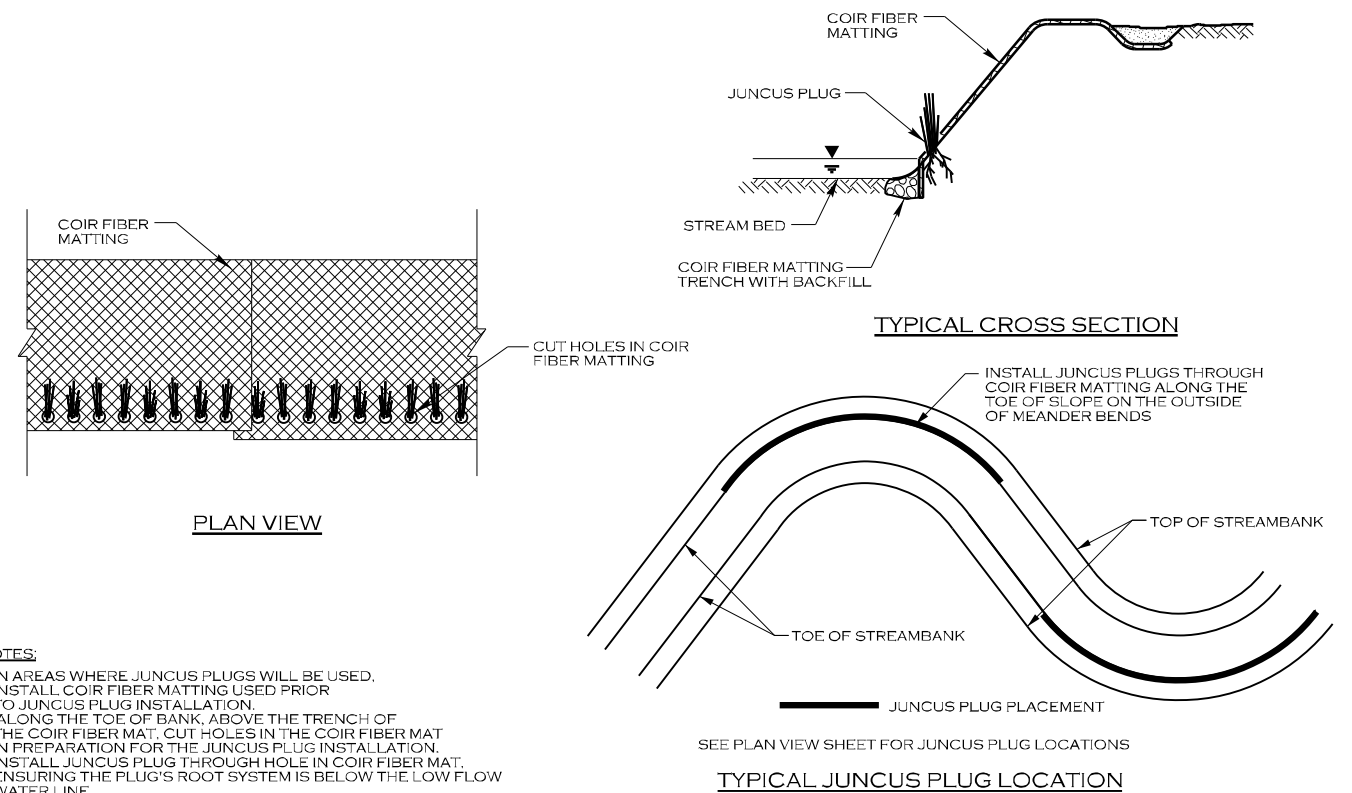
**KBC PLANTING BAR**

PLANTING BAR SHALL HAVE A BLADE WITH A TRIANGULAR CROSS SECTION, AND SHALL BE 12 INCHES LONG, 4 INCHES WIDE AND 1 INCH THICK AT CENTER.

**ROOT PRUNING**

ALL SEEDLINGS SHALL BE ROOT PRUNED, IF NECESSARY, SO THAT NO ROOTS EXTEND MORE THAN 10 INCHES BELOW THE ROOT COLLAR.

**JUNCUS PLUG**



**NOTES:**

1. IN AREAS WHERE JUNCUS PLUGS WILL BE USED, INSTALL COIR FIBER MATTING USED PRIOR TO JUNCUS PLUG INSTALLATION.
2. ALONG THE TOE OF BANK, ABOVE THE TRENCH OF THE COIR FIBER MAT, CUT HOLES IN THE COIR FIBER MAT IN PREPARATION FOR THE JUNCUS PLUG INSTALLATION.
3. INSTALL JUNCUS PLUG THROUGH HOLE IN COIR FIBER MAT, ENSURING THE PLUG'S ROOT SYSTEM IS BELOW THE LOW FLOW WATER LINE.

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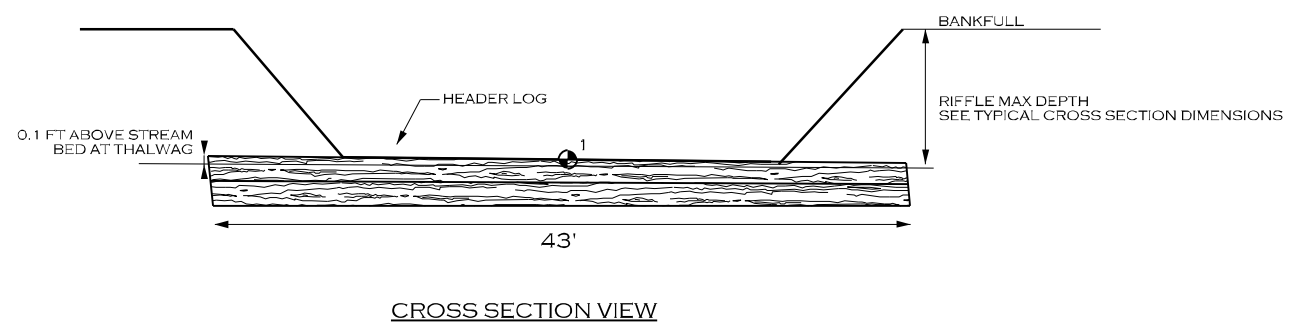
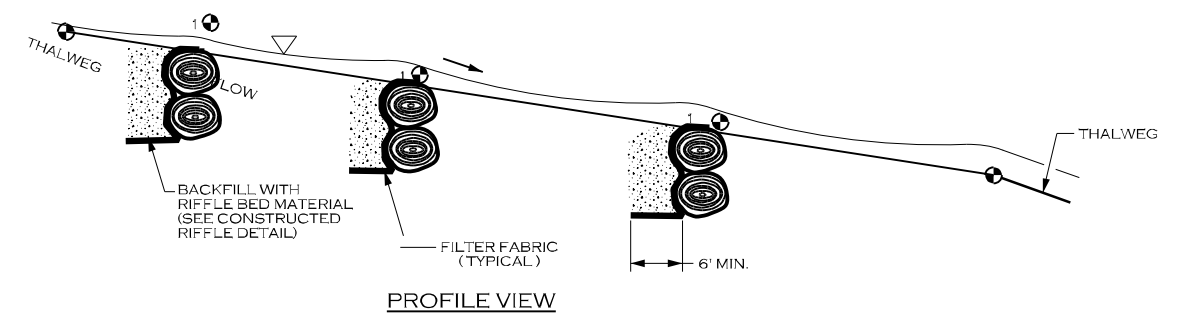
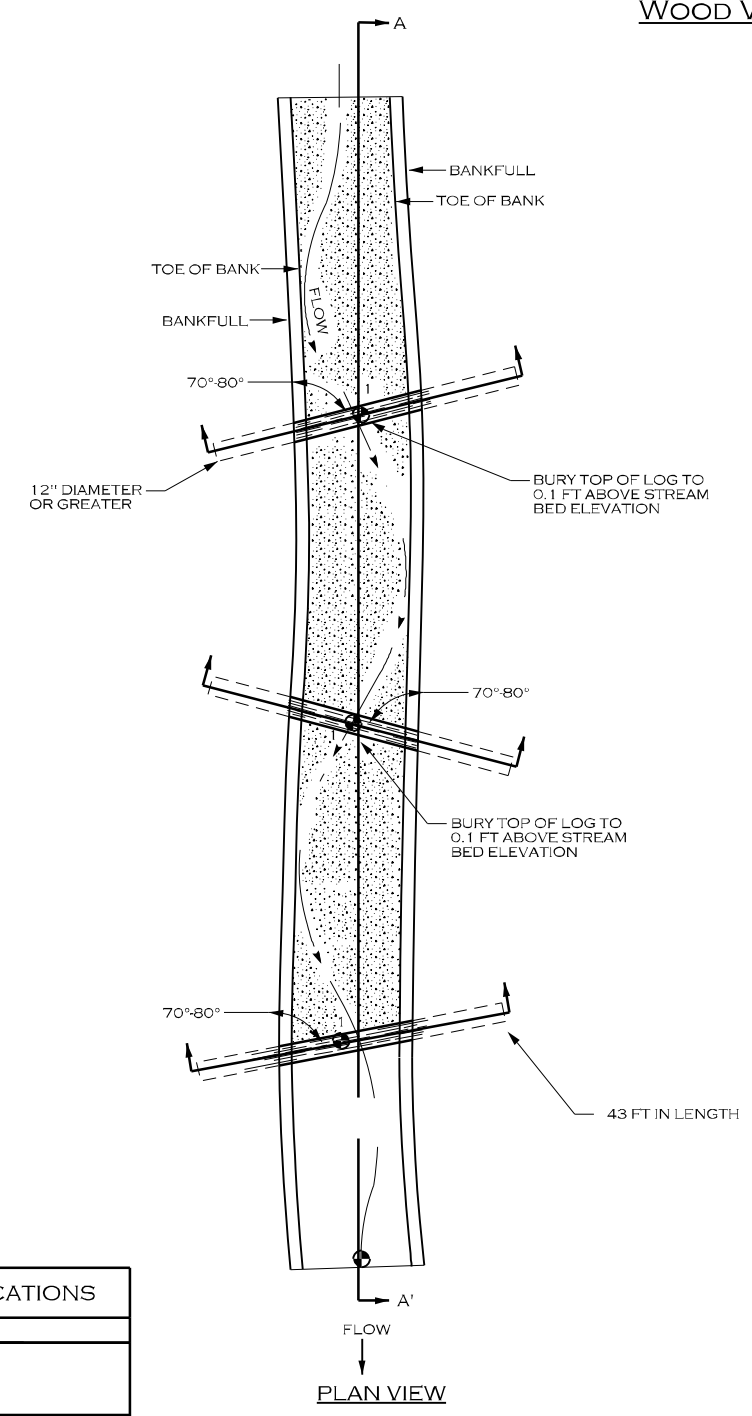
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DETAILS




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WOOD VALLEY GRADE CONTROL SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
RIFFLE BED MATERIAL	SEE CONSTRUCTED RIFFLE DETAIL
LOGS	TYPE: HARDWOOD SIZE: LENGTH = 43 FEET, 12\"/>
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
<b>NOTES FOR LOG ROLLER STRUCTURES:</b>	
1. STRUCTURE DIMENSIONS AND MEASUREMENTS ARE SHOWN ON THE STRUCTURE TABLES SHEET. NUMBER OF LOGS MAY VARY.	
2. LOGS SHOULD BE STRAIGHT, HARDWOOD, AND NOT ROTTEN.	
3. SOIL SHOULD BE COMPACTED WELL AROUND BURIED PORTIONS OF LOGS.	
4. FILTER FABRIC SHOULD BE NAILED TO THE LOG BELOW THE STONE BACKFILL.	
5. RIFFLE STATIONS AND ELEVATIONS (1 & 5) ARE SHOWN ON BOTH THE STRUCTURE TABLES FOR WOOD VALLEY GRADE CONTROL AND CONSTRUCTED RIFFLES IF APPLICABLE.	
6. NUMBER OF LOGS MAY VARY.	

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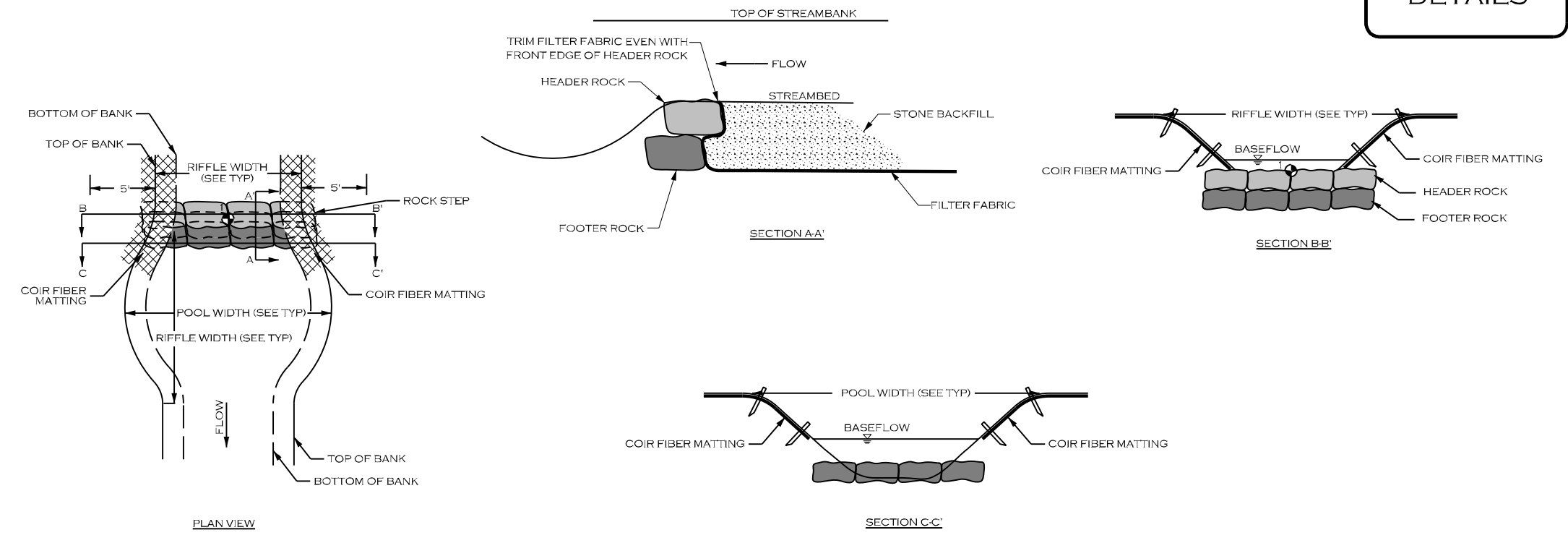
ROCK STEP (RS)

• ELEVATION POINT (SEE STRUCTURE TABLE)

ROCK STEP SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
BOULDER	TYPE: GRANITE OR COMPARABLE SIZE: 3 FT X 2 FT X 2 FT
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
COIR FIBER MATTING	TYPE: SEE DETAIL

**NOTES FOR ROCK STEP STRUCTURES:**

- DIG A TRENCH BELOW THE STREAM BED FOR FOOTER AND HEADER ROCKS, FILTER FABRIC AND STONE BACKFILL.
- PLACE FOOTER ROCKS AND THEN HEADER ROCKS TO ACHIEVE DESIGN DIMENSIONS AND ELEVATIONS.
- USE HAND PLACED STONE TO FILL GAPS AND VOIDS ON UPSTREAM SIDE OF THE HEADER AND FOOTER ROCKS.
- PLACE FILTER FABRIC BEGINNING AT THE TOP OF THE HEADER ROCKS AND EXTENDING DOWN TO THE DEPTH OF THE FOOTER ROCKS, THEN OUTWARD THE DISTANCE SPECIFIED IN THE STRUCTURES TABLE SHEET.
- INSTALL STONE BACKFILL, AS SHOWN, TO THE DIMENSIONS INDICATED IN THE STRUCTURES TABLE SHEET.
- AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ONSITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.
- PLACE TRANSPLANTS FROM TOE OF STREAMBANK TO TOP OF STREAMBANK.
- TRANSPLANTS CAN BE SUBSTITUTED WITH COIR FIBER MATTING AT THE DIRECTION OF THE ENGINEER.

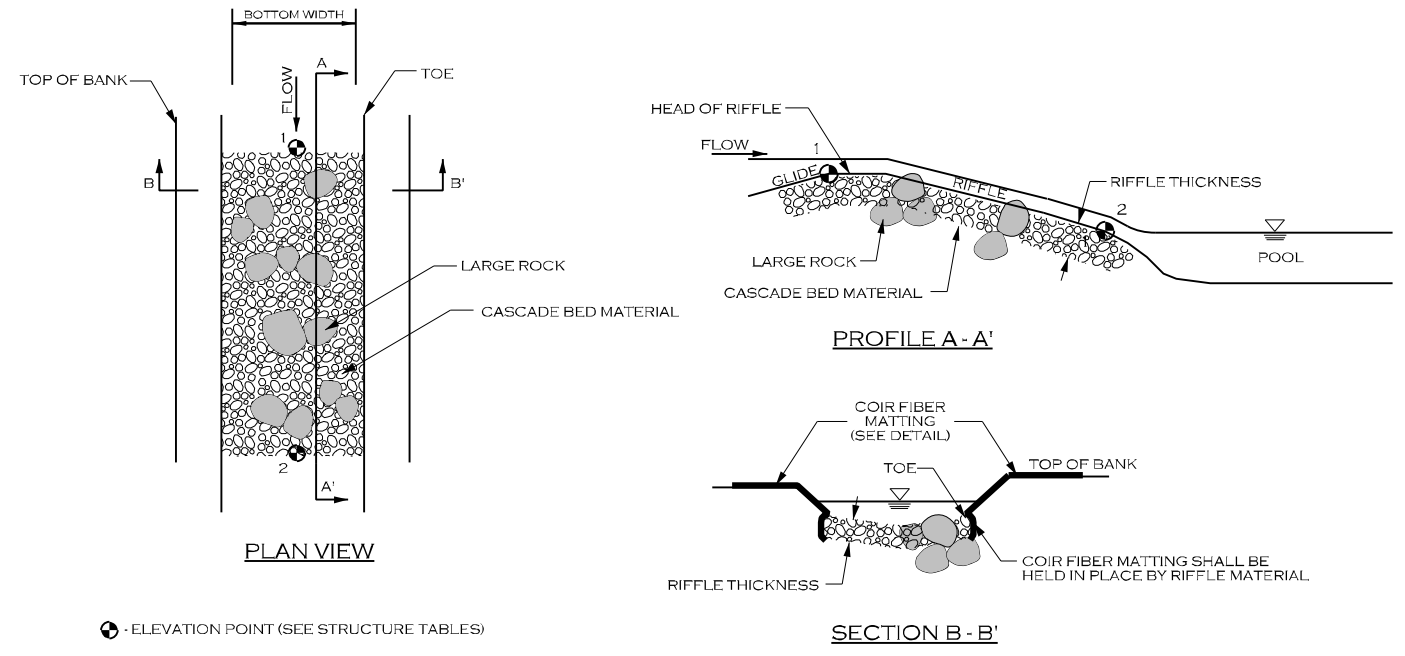


CONSTRUCTED CASCADE (CC)

CONSTRUCTED CASCADE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
LARGE ROCKS	TYPE: GRANITE OR COMPARABLE SIZE: 2 X 1 X 1 FT THICKNESS: 24 INCHES MIN.
CASCADE BED MATERIAL	TYPE: GRANITE OR COMPARABLE SIZE: CLASS A AND CLASS B (50/50 MIX) THICKNESS: 16 INCHES MIN.
COIR FIBER MATTING	SEE DETAIL

**NOTES FOR CONSTRUCTED CASCADE STRUCTURES:**

- GRADE STREAMBED AND BANKS TO PROPOSED DIMENSIONS PER TYPICAL CROSS-SECTION AND PROFILE.
- EXCAVATE TRENCH BELOW PROPOSED STREAMBED ELEVATION EQUAL TO OR GREATER THAN RIFFLE THICKNESS.
- PLACE COIR FIBER MATTING ON BANKS AND LAY DOWN INTO TRENCH EXCAVATED FOR RIFFLE BED MATERIAL.
- FILL TRENCH WITH STONE TO FINAL DESIGN STREAM GRADE.



• ELEVATION POINT (SEE STRUCTURE TABLES)

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# VEGETATION SELECTION

## TABLES

### SOUTH-CENTRAL OAK-HARDWOOD & PINE FOREST

PIGNET HICKORY (*CARYA GLABRA*)  
 MOCKERNUT HICKORY (*CARYA TOMENTOSA*)  
 FLOWERING DOGWOOD (*CORNUS FLORIDA*)  
 EASTERN RED CEDAR (*JUNIPERUS VIRGINIANA*)  
 TULIP POPLAR (*LIRIODENDRON TULIPIFERA*)  
 BLACK GUM (*NYSSA SYLVATICA*)

SOURWOOD (*OXYDENDRUM ARBOREUM*)  
 SHORTLEAF PINE (*PINUS ECHINATA*)  
 SOUTHERN RED OAK (*QUERCUS FALCATA*)  
 NORTHERN RED OAK (*QUERCUS RUBRA*)  
 POST OAK (*QUERCUS STELLATA*)  
 BLACK OAK (*QUERCUS VELUTINA*)

### CENTRAL MESOPHYTIC HARDWOOD FOREST

SOUTHERN SUGAR MAPLE (*ACER BARBATUM*)  
 RED MAPLE (*ACER RUBRUM*)  
 SOUTHERN SHAGBARK HICKORY (*CARYA CAROLINAE-SEPTRIONALIS*)  
 PIGNET HICKORY (*CARYA GLABRA*)  
 MOCKERNUT HICKORY (*CARYA TOMENTOSA*)  
 SUGARBERRY (*CELTIS LAEVIGATA*)  
 AMERICAN BEECH (*FAGUS GRANDIFOLIA*)  
 WHITE ASH (*FRAXINUS AMERICANA*)  
 BLACK WALNUT (*JUGLANS NIGRA*)  
 TULIP POPLAR (*LIRIODENDRON TULIPIFERA*)

CUCUMBER MAGNOLIA (*MAGNOLIA ACUMINATA*)  
 BLACK GUM (*NYSSA SYLVATICA*)  
 WHITE OAK (*QUERCUS ALBA*)  
 BLACK OAK (*QUERCUS NIGRA*)  
 NORTHERN RED OAK (*QUERCUS RUBRA*)  
 AMERICAN BASSWOOD (*TILIA AMERICANA*)  
 IRONWOOD (*CARPINUS CAROLINIANA*)  
 REDBUD (*CERCIS CANADENSIS*)  
 FLOWERING DOGWOOD (*CORNUS FLORIDA*)  
 HOP HORNBEAM (*OSTRYA VIRGINIANA*)  
 SOURWOOD (*OXYDENDRUM ARBOREUM*)

### SOUTHERN FLOODPLAIN HARDWOOD FOREST

SOUTHERN SUGAR MAPLE (*ACER BARBATUM*)  
 BOXELDER (*ACER NEGUNDO*)  
 RED MAPLE (*ACER RUBRUM*)  
 RIVER BIRCH (*BETULA NIGRA*)  
 SHAGBARK HICKORY (*CARYA OVATA*)  
 SUGARBERRY (*CELTIS LAEVIGATA*)  
 AMERICAN BEECH (*FAGUS GRANDIFOLIA*)  
 BLACK WALNUT (*JUGLANS NIGRA*)  
 TULIP POPLAR (*LIRIODENDRON TULIPIFERA*)  
 BLACK GUM (*NYSSA SYLVATICA*)  
 AMERICAN SYCAMORE (*PLATANUS OCCIDENTALIS*)  
 WHITE OAK (*QUERCUS ALBA*)  
 SWAMP CHESTNUT OAK (*QUERCUS MICHAUXII*)

WILLOW OAK (*QUERCUS PHELLOS*)  
 NORTHERN RED OAK (*QUERCUS RUBRA*)  
 AMERICAN BASSWOOD (*TILIA AMERICANA*)  
 AMERICAN ELM (*ULMUS AMERICANA*)  
 SWITCH CANE (*ARUNDINARIA TECTA*)  
 BEAUTYBERRY (*CALLICARPA AMERICANA*)  
 IRONWOOD (*CARPINUS CAROLINIANA*)  
 FLOWERING DOGWOOD (*CORNUS FLORIDA*)  
 POSSUMHAW (*ILEX DECIDUA*)  
 EASTERN RED CEDAR (*JUNIPERUS VIRGINIANA*)  
 SPICEBUSH (*LINDERA BENZOIN*)  
 SOURWOOD (*OXYDENDRUM ARBOREUM*)

### EASTERN NORTH AMERICA WET MEADOW AND MARSH

SILKY DOGWOOD (*CORNUS AMOMUM*)  
 BLACK WILLOW (*SALIX NIGRA*)

BUTTONBUSH (*CEPHALANTHUS OCCIDENTALIS*)

### NORTHERN & CENTRAL SWAMP FOREST (STREAMSIDE ASSEMBLAGE)

RED MAPLE (*ACER RUBRUM*)  
 BLACK GUM (*NYSSA SYLVATICA*)  
 WILLOW OAK (*QUERCUS PHELLOS*)  
 TAG ALDER (*ALNUS SERRULATA*)

IRONWOOD (*CARPINUS CAROLINIANA*)  
 SILKY DOGWOOD (*CORNUS AMOMUM*)  
 POSSUMHAW (*ILEX DECIDUA*)  
 ELDERBERRY (*SAMBUCUS CANADENSIS*)

### NOTES:


- SPECIES LISTED ARE PRELIMINARY AND MAY BE MODIFIED BASED ON AVAILABILITY AT THE TIME OF PLANTING.
- SPECIES TO BE PLANTED WILL BE CLOSELY COORDINATED WITH THE US FOREST SERVICE STAFF AT SUMTER NATIONAL FOREST, ENOREE RANGE DISTRICT.
- CLEARING AND REMOVAL OF EXISTING TREES AND VEGETATION WILL BE LIMITED TO THE EXTENT PRACTICABLE.
- ALL DISTURBED AREAS WILL BE REPLANTED WITH APPROPRIATE HERBACEOUS AND WOODY SPECIES, BASED ON LANDSCAPE POSITION, MOISTURE REGIME, LANDFORM, AND SOILS.
- THE NORTHERN AND CENTRAL SWAMP FOREST (STREAMSIDE ASSEMBLAGE) CORRESPONDS TO VEGETATED WETLANDS IN SEEPAGES AND SMALL STREAM HEADWATERS.
- THE SOUTHERN FLOODPLAIN HARDWOOD FOREST IS THE PRIMARY TARGET COMMUNITY FOR FLOODPLAIN AREAS.
- THE EASTERN NORTH AMERICAN WET MEADOW AND MARSH AREAS CORRESPOND TO LOW LYING AND DEPRESSIONAL (FLOODPLAIN POOL) AREAS.
- THE CENTRAL MESOPHYTIC HARDWOOD FOREST SPECIES WILL BE PLANTED ALONG TERRACE AND VALLEY SIDE SLOPES.
- THE SOUTH-CENTRAL OAK-HARDWOOD AND PINE FOREST WILL BE REPLANTED ON ADJACENT UPLAND AND ACCESS AREAS WITHIN THE LIMITS OF DISTURBANCE.

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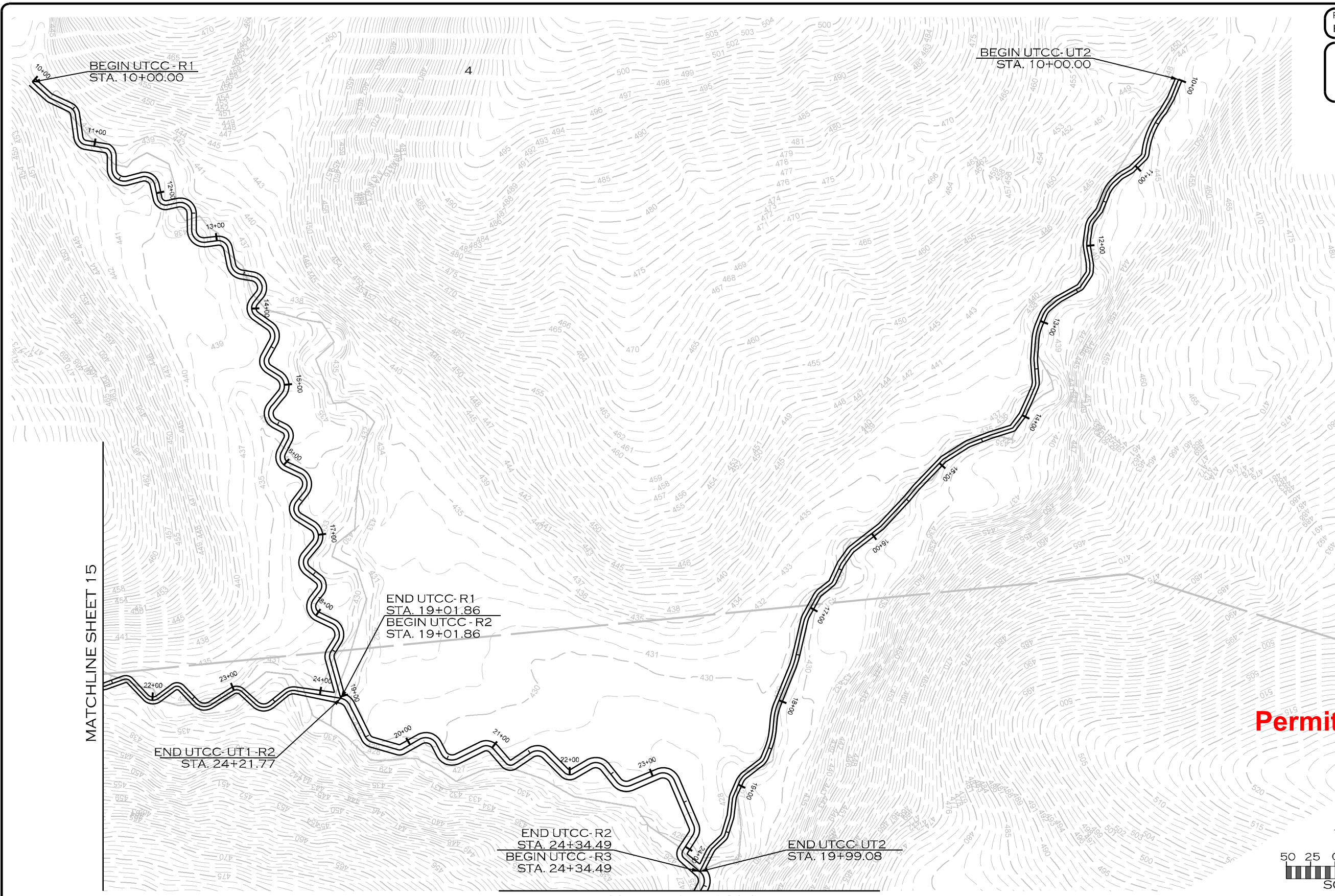
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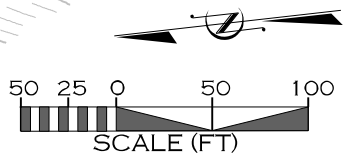
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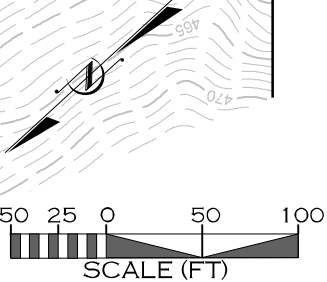
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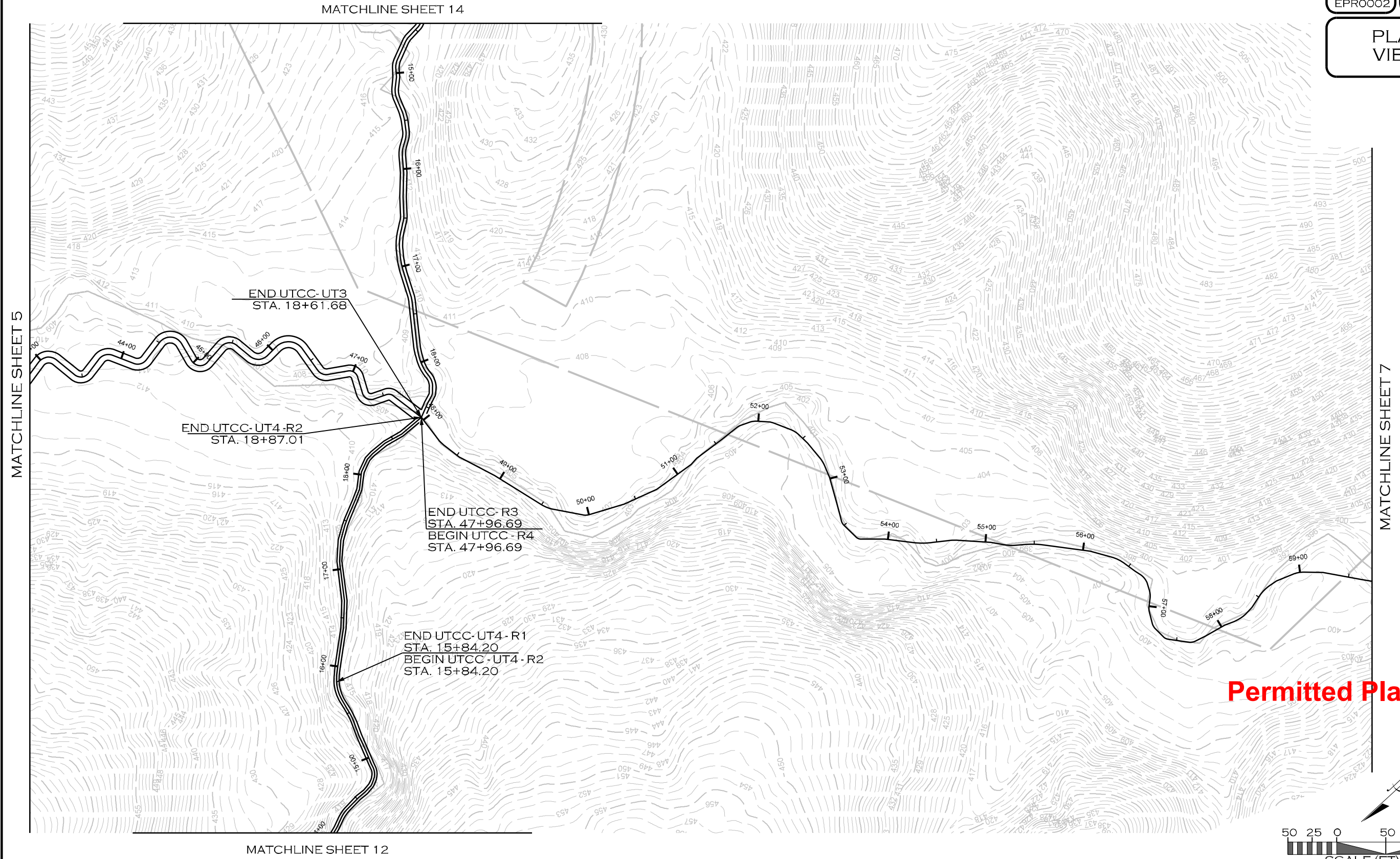
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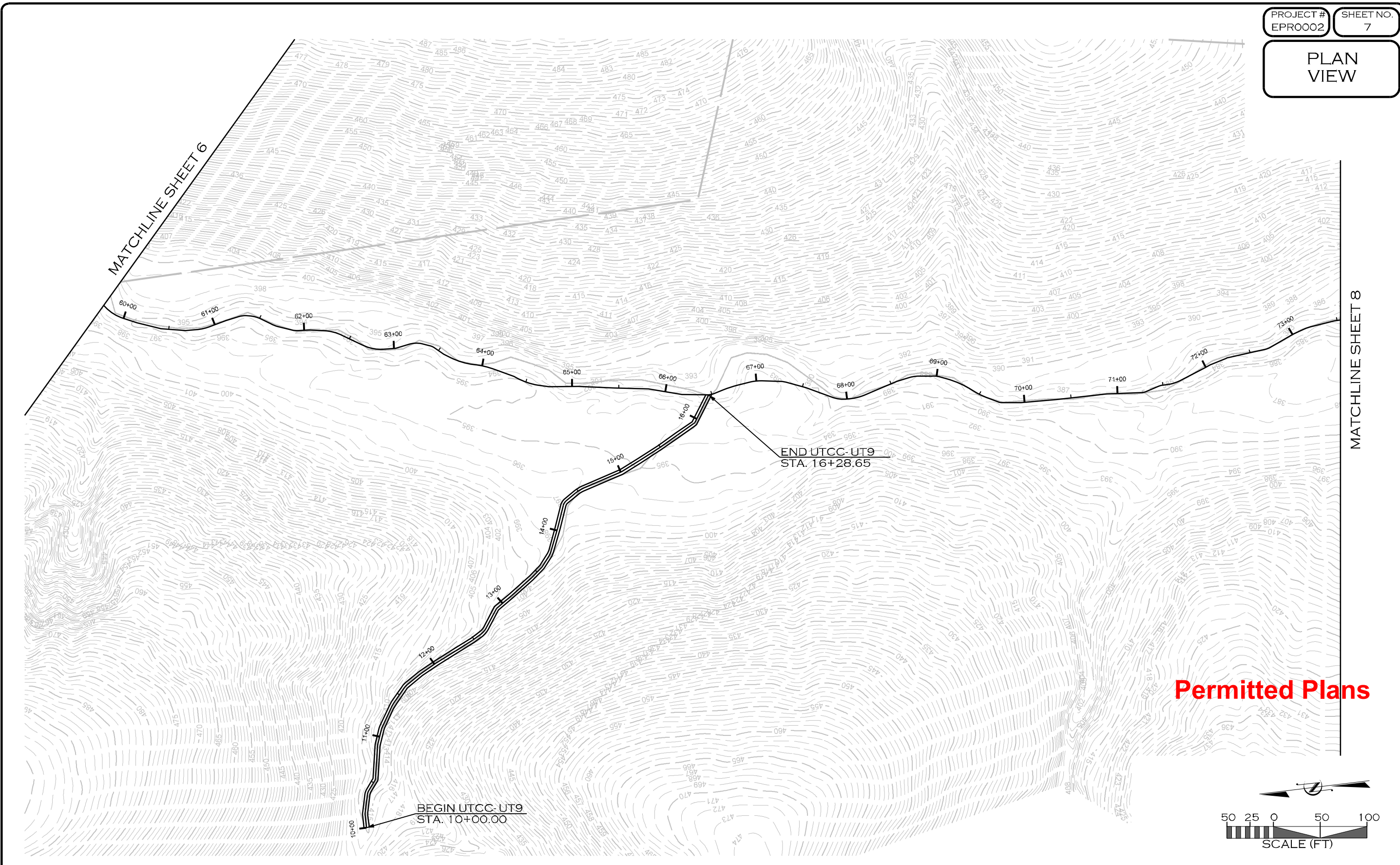
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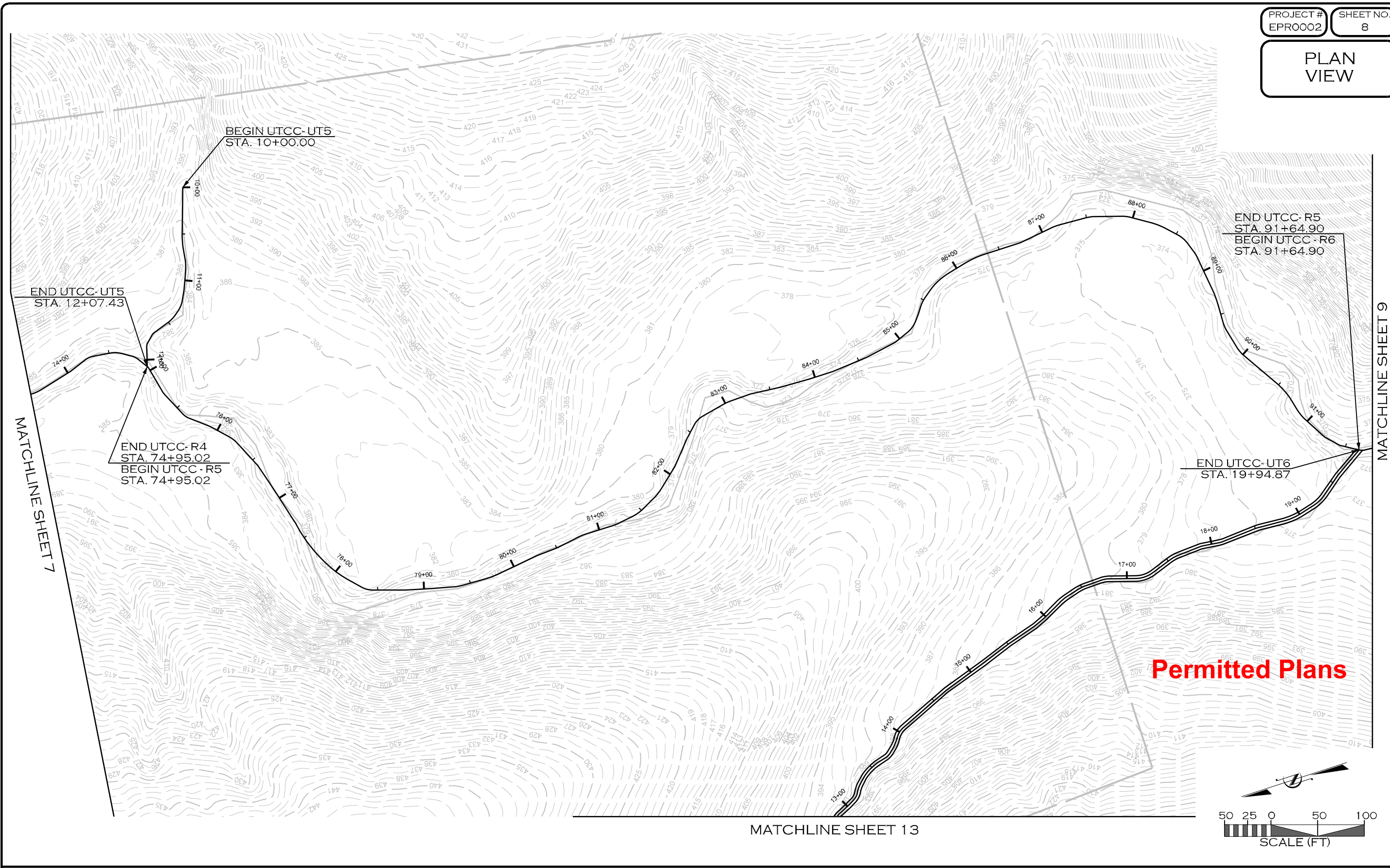


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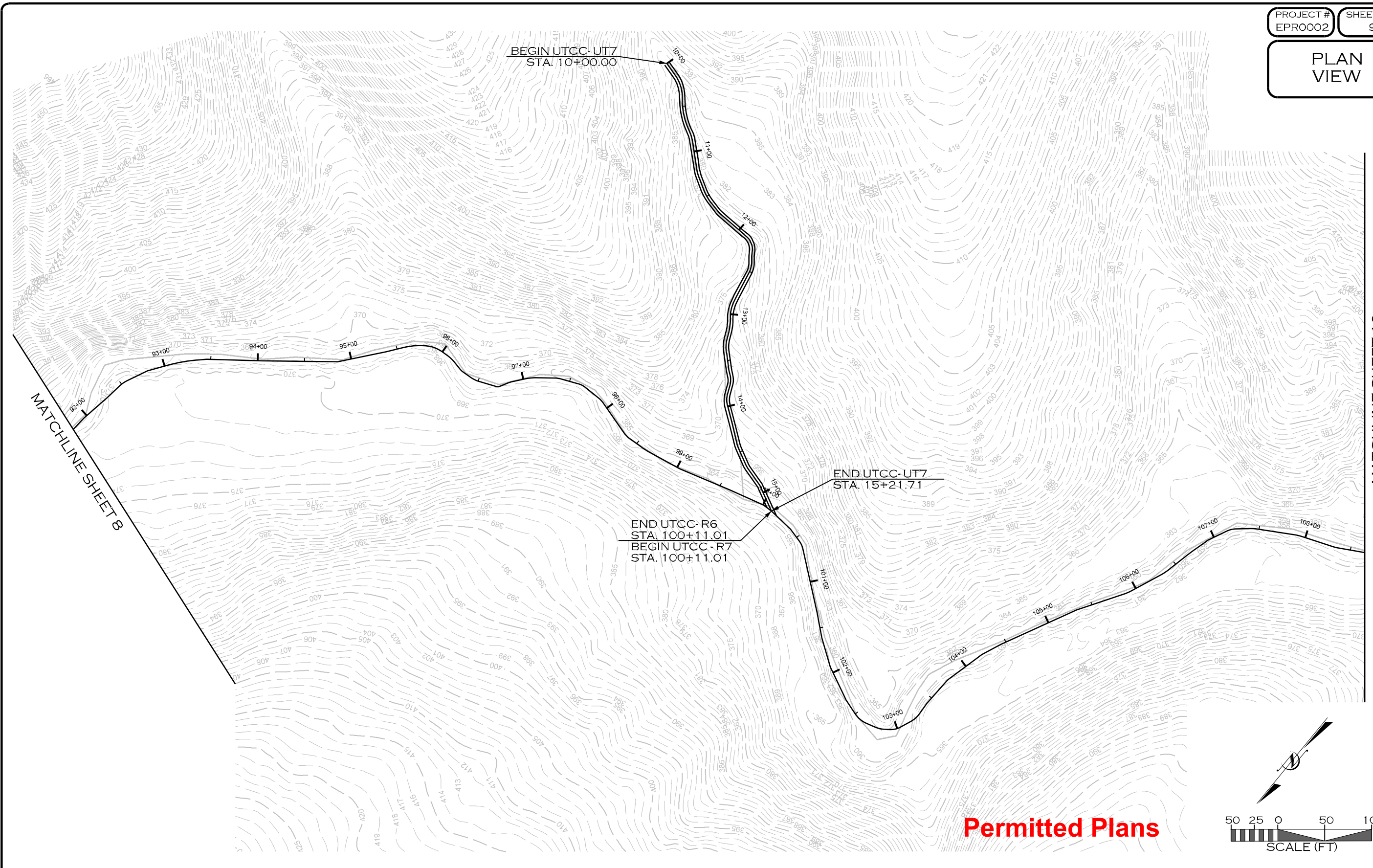


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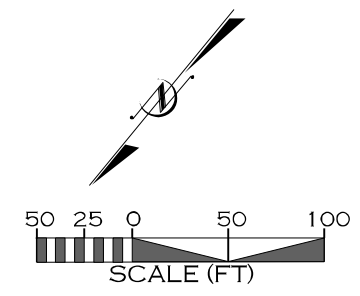
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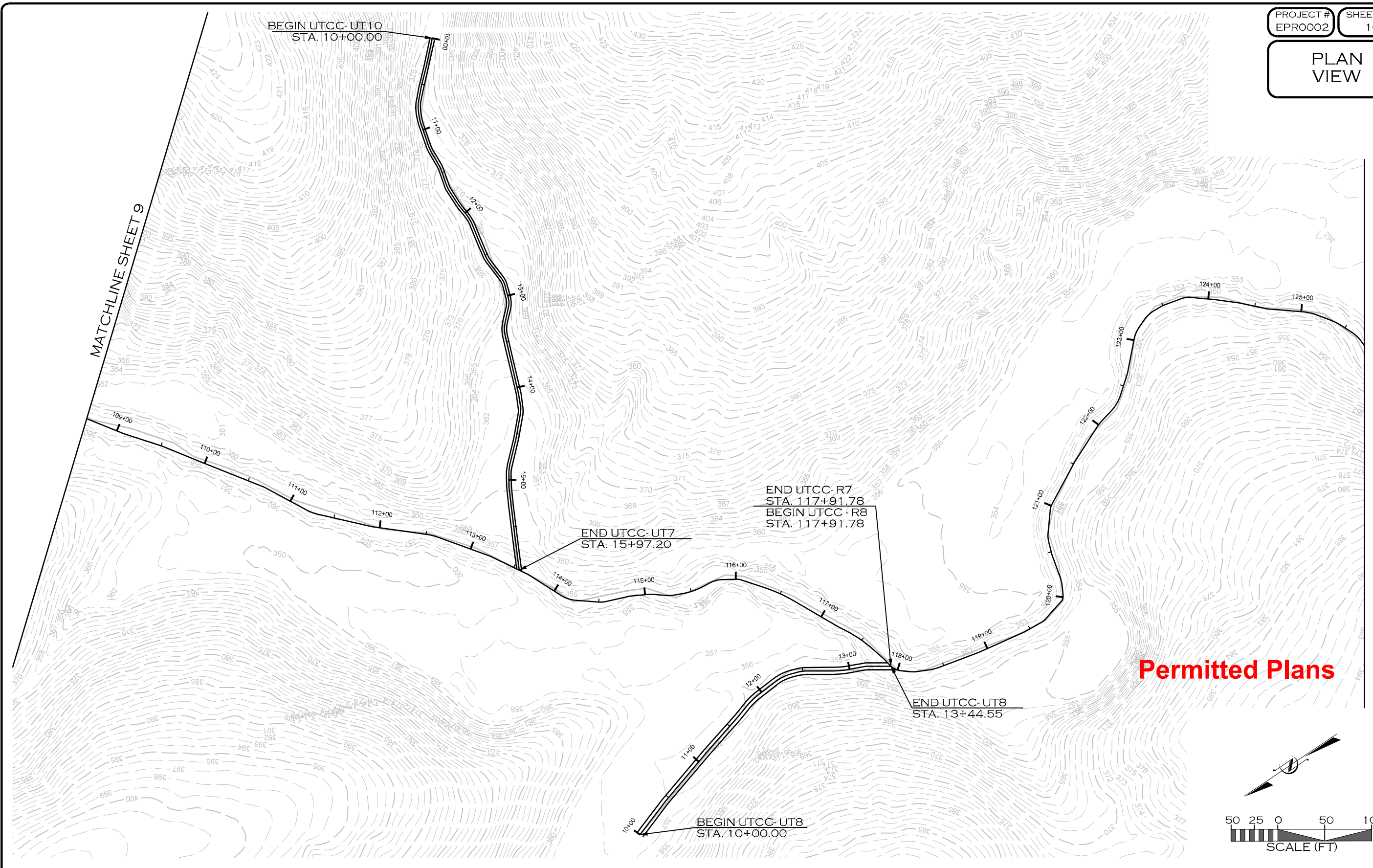
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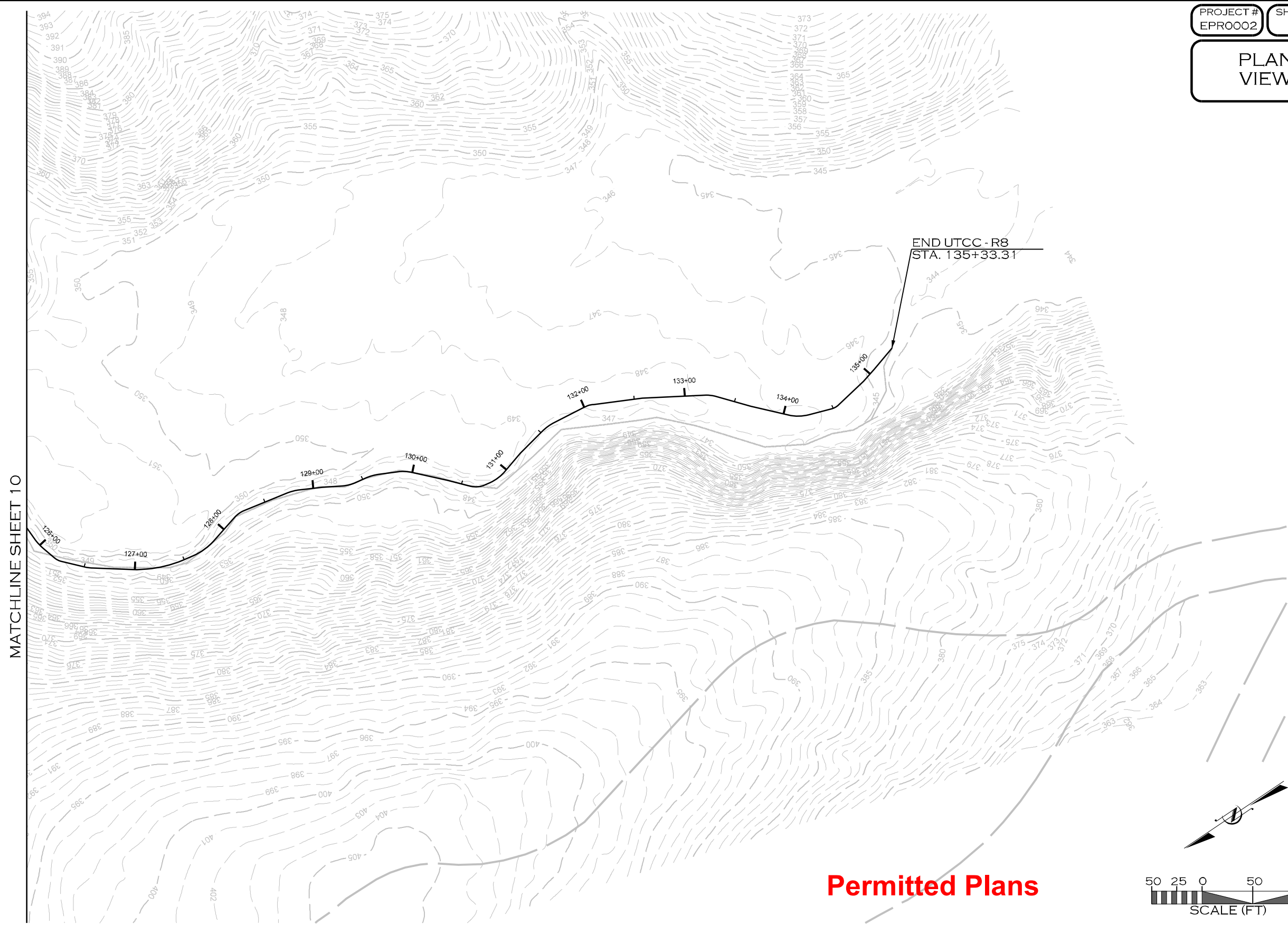


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CHESTER COUNTY, SOUTH CAROLINA

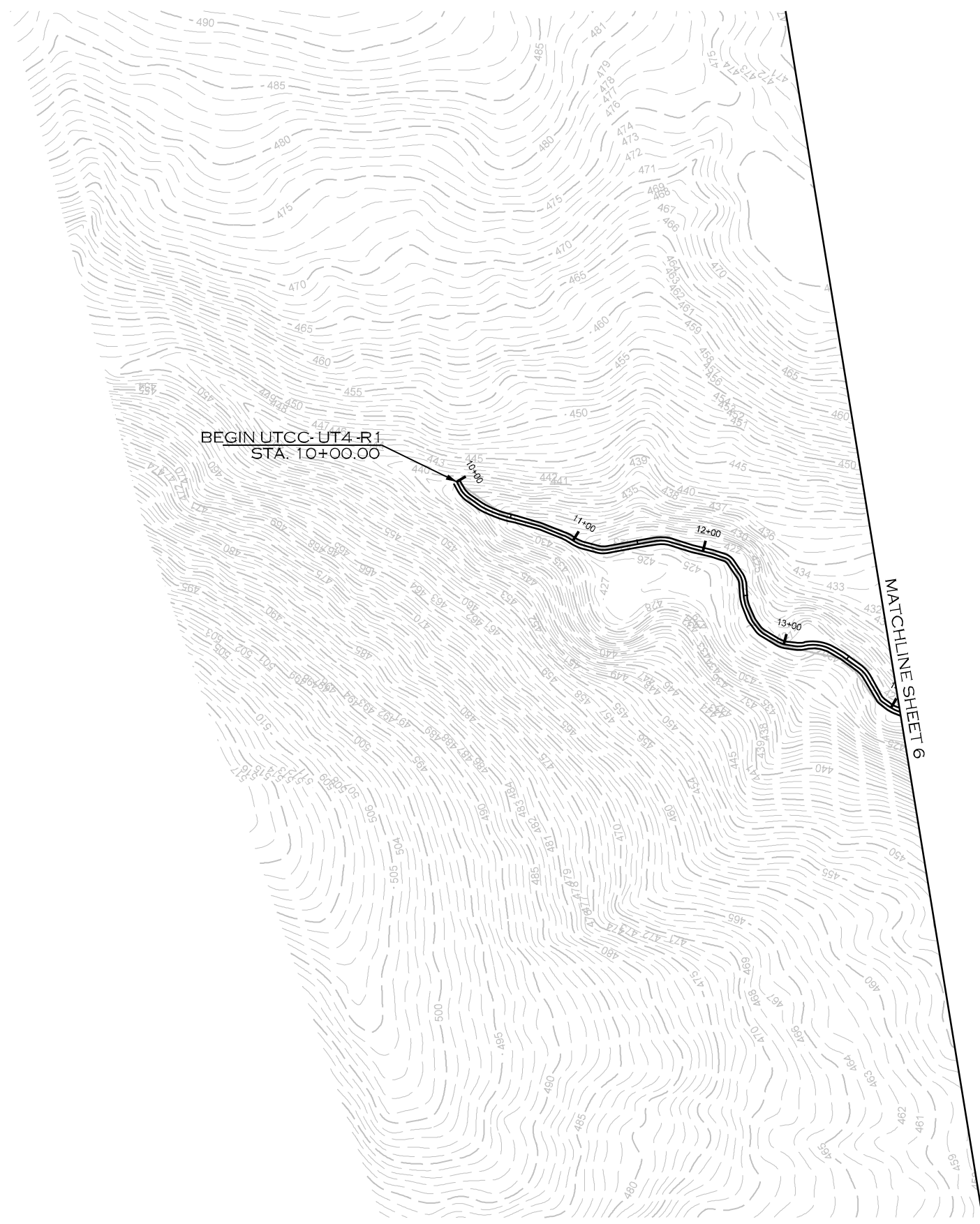
PREPARED IN THE OFFICE OF:



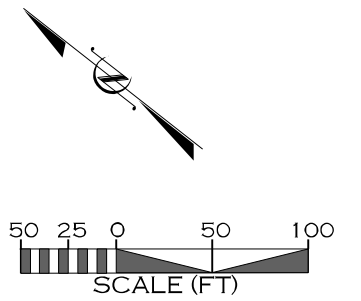
1150 SE MAYNARD RD, SUITE 140  
CARY, NC 27511  
LICENSE # 5371

PROJECT ENGINEER

**PROGRESS DRAWING**  
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DO NOT USE FOR CONSTRUCTION



**Permitted Plans**



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REVISIONS				
NO.	DESCRIPTION	ENGR.	APPROV.	DATE
1	PERMITTING DESIGN PLANS	EB	KLT	10/25/23

PREPARED FOR:

SC DEPARTMENT OF COMMERCE  
FOR SCOUT MOTORS

SUMTER NATIONAL FOREST  
ENROEE RANGER DISTRICT  
STREAM AND RIPARIAN RESTORATION/  
ENHANCEMENT PROJECT  
UT TO CLARKS CREEK WATERSHED  
CHESTER COUNTY, SOUTH CAROLINA

PREPARED IN THE OFFICE OF:

**ECOSYSTEM  
PLANNING &  
RESTORATION**

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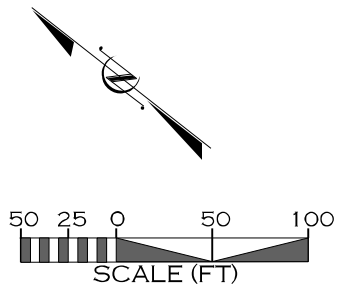
PLAN  
VIEW



BEGIN UTCC: UT6  
STA. 10+00.00

MATCHLINE SHEET 8

Permitted Plans



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REVISIONS				
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PREPARED FOR:

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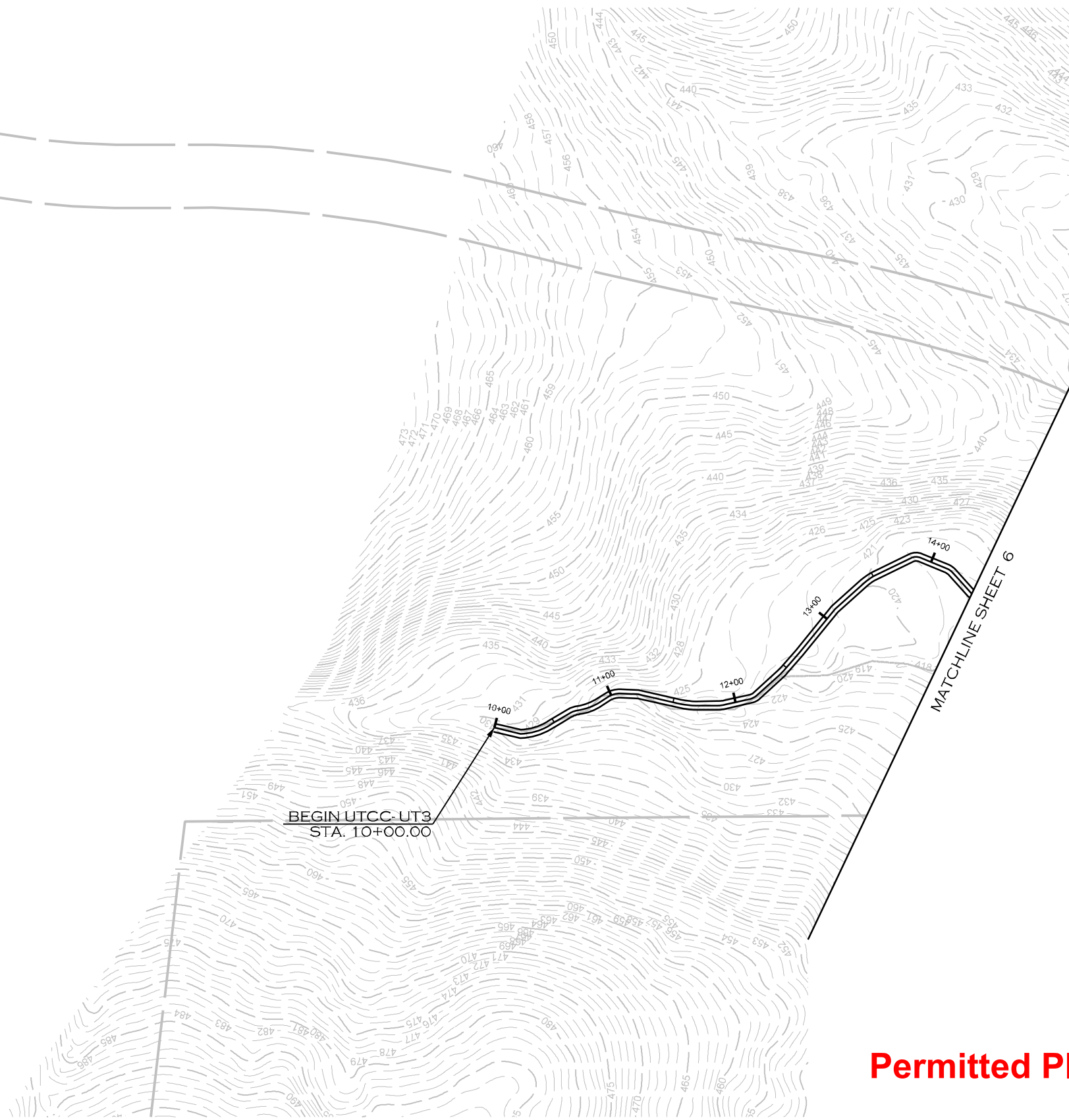
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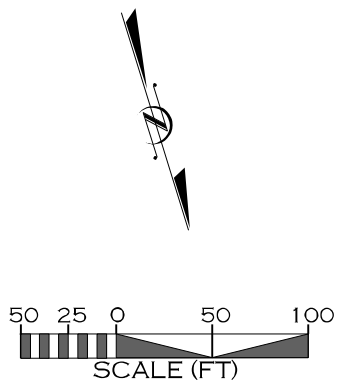
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PLAN  
VIEW



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REVISIONS				
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PREPARED FOR:



SC DEPARTMENT OF COMMERCE  
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CHESTER COUNTY, SOUTH CAROLINA

PREPARED IN THE OFFICE OF:



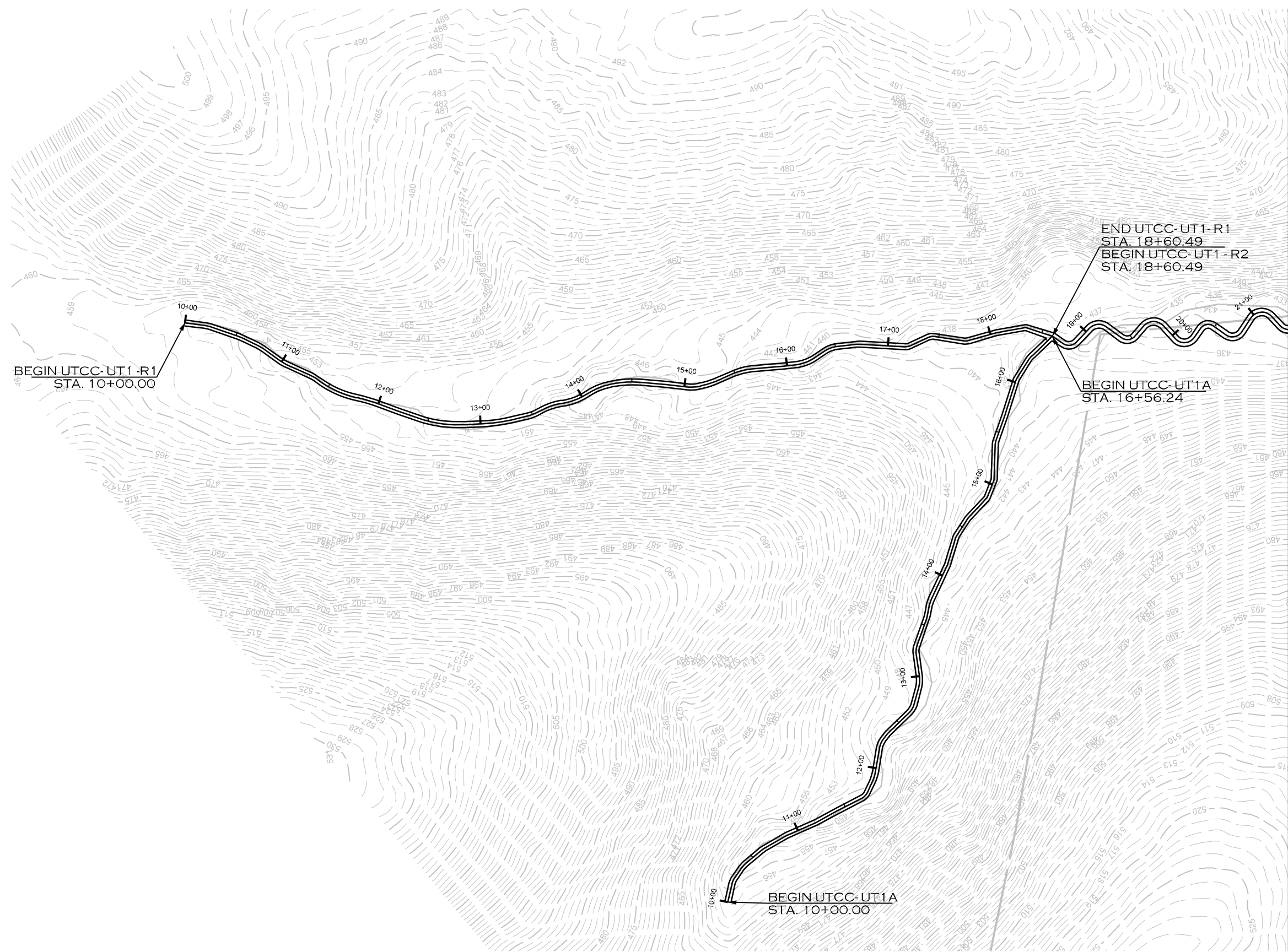
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LICENSE # 5371

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PLAN  
VIEW



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PREPARED FOR:



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STREAM AND RIPARIAN RESTORATION/  
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CHESTER COUNTY, SOUTH CAROLINA

PREPARED IN THE OFFICE OF:

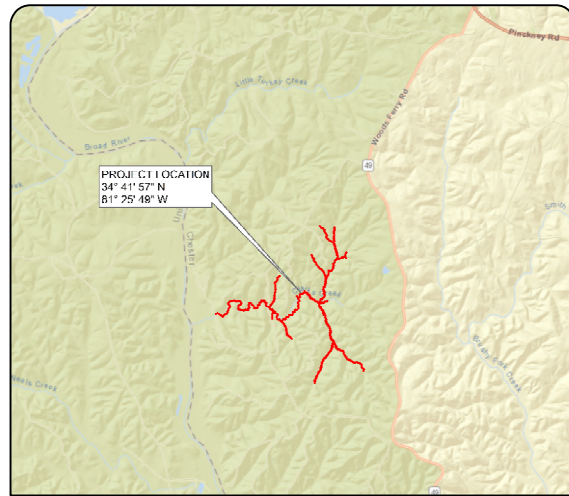


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SUMTER NATIONAL FOREST ENROEE RANGER DISTRICT STREAM AND RIPARIAN RESTORATION/ENHANCEMENT PROJECT



VICINITY MAP

INDEX OF SHEETS

- 1... TITLE SHEET
- 1A... STREAM CONVENTIONAL SYMBOLS  
GENERAL NOTES
- 2... TYPICAL SECTIONS
- 2A-2M... DETAILS
- 3A... TABLES
- 4-24... PLAN VIEW

# SC DEPARTMENT OF COMMERCE FOR SCOUT MOTORS

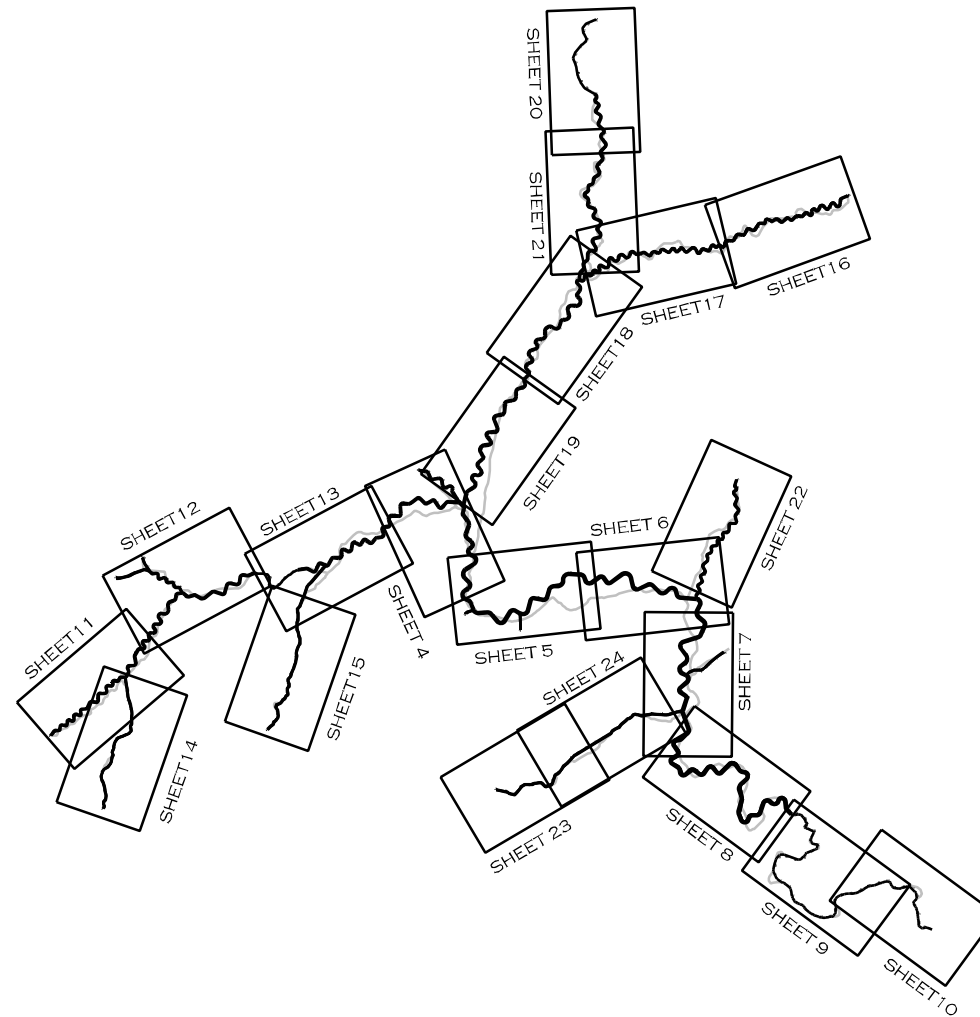
# CHESTER COUNTY

LOCATION: CLARKS CREEK, CHESTER COUNTY, SC  
TYPE OF WORK: STREAM RESTORATION AND  
STREAM ENHANCEMENT

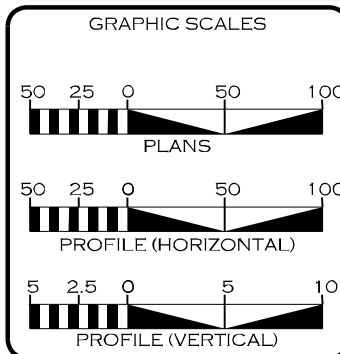
USACE PERMIT NO: SAS-2023-00690

STATE	PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
SC	EPR0002	1	38

PROPOSED DESIGN STREAM LENGTH
EXISTING STREAM LENGTH = 38,462'
PROPOSED STREAM LENGTH = 40,407'



Permitted Plans



REVISIONS				
NO.	DESCRIPTION	ENGR.	APPROV.	DATE
1	PERMITTING DESIGN PLANS	EB	KLT	10/25/23

PREPARED FOR:

SC DEPARTMENT OF COMMERCE  
FOR SCOUT MOTORS

PREPARED IN THE OFFICE OF:

ECOSYSTEM  
PLANNING &  
RESTORATION

1150 SE MAYNARD RD  
SUITE 140  
CARY, NC 27511  
LICENSE # 5371

LETTING DATE: \_\_\_\_\_

ERIN BENNETT, PE  
PROJECT ENGINEER

PROJECT ENGINEER













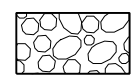




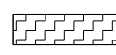
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SIGNATURE: \_\_\_\_\_ P.E.



SYMBOLGY /  
NOTES

STREAM CONVENTIONAL SYMBOLS

	ROCK J-HOOK	(JH)	— SF —	SAFETY FENCE
	ROCK VANE	(RV)	— TP —	TAPE FENCE
	OFFSET ROCK CROSS VANE	(OV)	—     —	SILT FENCE
	GRADE CONTROL J-HOOK VANE	(RJH)	— CE —	CONSERVATION EASEMENT
	ROCK CROSS VANE	(XV)	-- 20 --	EXISTING MAJOR CONTOUR
	TEMPORARY SILT CHECK		-----	EXISTING MINOR CONTOUR
	ROOT WAD	(RW)	-----	LIMITS OF DISTURBANCE
	LOG J-HOOK	(JH)	--- 10+00 ---	BANKFULL BENCH (GRADE)
	LOG VANE	(LV)	————	STREAM THALWEG
	LOG STEP	(LS)	————	STREAM TOP OF BANKS
	ROCK STEP	(RS)	))	FOOT BRIDGE
	LOG CROSS VANE	(XV)		TEMPORARY STREAM CROSSING
	CONSTRUCTED RIFFLE	(CR)		PERMANENT STREAM CROSSING
	CONSTRUCTED CASCADE	(CC)	⬇	TRANSPLANTED VEGETATION
	WOODY VALLEY GRADE CONTROL	(WV GC)	⊗	TREE REMOVAL
	LOG ROLLER	(LR)	⊕	TREE PROTECTION
	GRADE CONTROL WOODY RIFFLE	(WFR)	⊗	CHANNEL PLUG
	GEOLIFT	(GL)	■	CHANNEL FILL / DITCH PLUG
			▨	GRADE BANK
			AAA	LOG STEP POOL (SP)
			▨	TOEWOOD (TW)
			⤴	SOD MATS (SM)
			⊗	DEBRIS JAM (DJ)
			⤴	JUNCUS PLUG (JP)

\*\*NOTE: ALL ITEMS ABOVE MAY NOT BE USED ON THIS PROJECT

GENERAL NOTES


- NO CONSTRUCTION WORK SHALL COMMENCE BEFORE AN ONSITE MEETING WITH THE ENGINEER, CLIENT, US FOREST SERVICE, AND CONTRACTOR.
- WORK IS BEING PERFORMED AS AN ENVIRONMENTAL RESTORATION PROJECT. THE CONTRACTOR SHALL MAKE ALL REASONABLE EFFORTS TO REDUCE SEDIMENT LOSS AND MINIMIZE DISTURBANCE OF THE SITE WHILE PERFORMING CONSTRUCTION WORK.
- THE CONTRACTOR IS REQUIRED TO INSTALL INSTREAM STRUCTURES USING A TRACK HOE EXCAVATOR WITH A HYDRAULIC THUMB OF SUFFICIENT SIZE TO PLACE BOULDERS AND STRUCTURES.
- CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL UTILITIES ARE ADEQUATELY LOCATED AND MARKED DURING CONSTRUCTION.
- ANY DAMAGE TO EXISTING ROADS, STRUCTURES, FACILITIES, ETC. RESULTING FROM ACTIONS OF THE CONTRACTOR WILL BE REPAIRED OR REPLACED AT THE EXPENSE OF THE CONTRACTOR, TO A QUALITY MEETING OR EXCEEDING THE PREVIOUS STANDARDS.
- WORK IS BEING PERFORMED IN A NATIONAL FOREST WITH PUBLIC ACCESS. CONTRACTOR SHALL ENSURE THAT ALL WORK IS CONDUCTED SAFELY, AND THAT THE SAFETY OF THE GENERAL PUBLIC IS ENSURED DURING ALL PHASES OF THE CONSTRUCTION WORK.
- IN THE EVENT OF A SPILL OR ILLICIT DISCHARGE, CONTACT THE ENOREE RANGER DISTRICT OFFICE AT (803) 276-4810.
- CONTRACTOR SHALL INSPECT ALL SAFETY AND EROSION CONTROL DEVICES, STRUCTURES, AND WORKS AT THE START OF EACH WORK DAY TO ENSURE THEY ARE PROPERLY PLACED AND FUNCTIONING.
- CONTRACTOR SHALL MAINTAIN ALL VEHICLES AND EQUIPMENT TO PREVENT DISCHARGE OF FUEL OR FLUIDS. ANY IDENTIFIED LEAKING EQUIPMENT SHALL BE REMOVED FROM THE WORK AREA AND SHALL BE REPAIRED AS SOON AS FEASIBLE.

Permitted Plans

10/25/2023  
L:\PROJECTS\EPR0002-SUMTER FOREST\PRM PROJECT\CADD\PLANS\CLARKS CREEK\SF\_CC\_PSH\_1A.DGN  
MKOON

REVISIONS				
NO.	DESCRIPTION	ENGR.	APPROV.	DATE
1	PERMITTING DESIGN PLANS	EB	KLT	10/25/23

PREPARED FOR:



SC DEPARTMENT OF COMMERCE  
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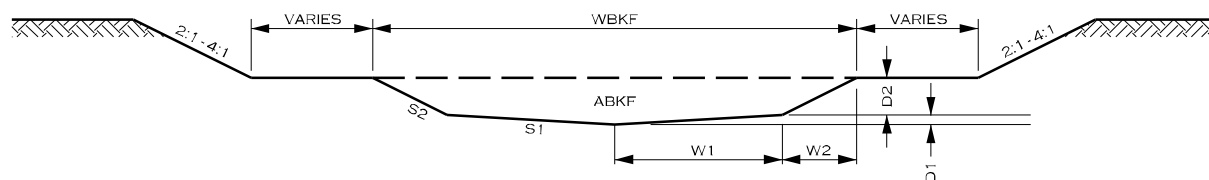
PROJECT ENGINEER

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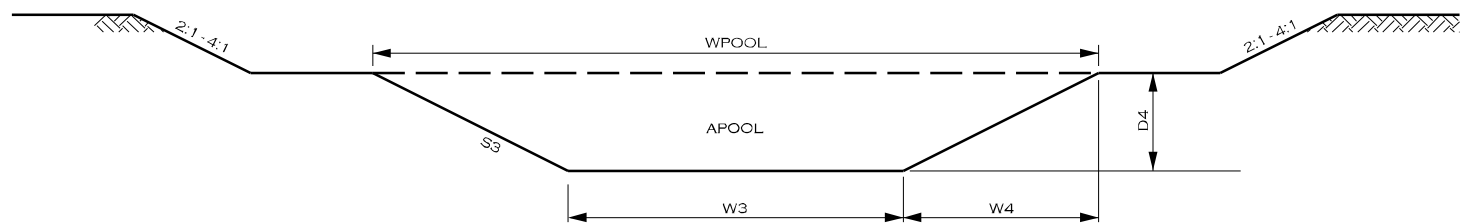
TYPICAL SECTIONS

DETAILS

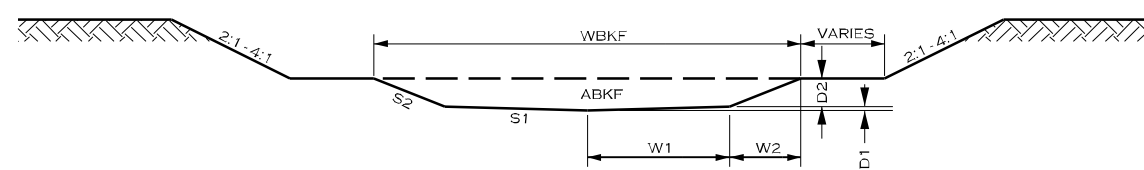
"B" AND "Bc" TYPE CHANNELS



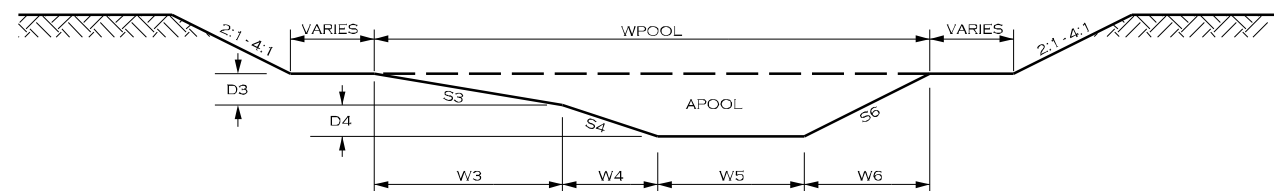
TYPICAL RIFFLE CROSS SECTION



"C", "Cb", AND "E" TYPE CHANNELS



TYPICAL RIFFLE CROSS SECTION



TYPICAL POOL RIGHT CROSS SECTION

**C, Cb, E STREAM, and MEANDERING TYPE REPRESENTATIVE CROSS SECTION DIMENSIONS**

Stream	Sheet Range	Station Range	RIFFLES								POOLS										
			ABKF	WBKF	W1	W2	D1	D2	S1	S2	APOOL	WPOOL	W3	W4	W5	W6	D3	D4	S3	S4	S6
CC-R1	4	10+00.00 - 16+47.07	12.4	12.2	2.7	3.4	0.17	1.36	16:1	2.5:1	30.2	18.3	6.1	3.0	3.0	6.1	1.52	1.52	4:1	2:1	2:1
CC-R2	4	16+47.07 - 17+06.73	24.5	17.1	3.8	4.8	0.24	1.91	16:1	2.5:1	59.7	25.7	8.6	4.3	4.3	8.6	2.14	2.14	4:1	2:1	2:1
CC-R3	4 - 5	17+06.73 - 30+79.68	34.3	20.3	4.5	5.6	0.28	2.25	16:1	2.5:1	83.6	30.4	10.1	5.1	5.1	10.1	2.54	2.54	4:1	2:1	2:1
CC-R4	5	30+79.68 - 37+01.93	34.8	20.4	4.5	5.7	0.28	2.27	16:1	2.5:1	84.8	30.7	10.2	5.1	5.1	10.2	2.55	2.55	4:1	2:1	2:1
CC-R5	5 - 6	37+01.93 - 61+88.00	35.8	20.7	4.6	5.8	0.29	2.30	16:1	2.5:1	87.3	31.1	10.4	5.2	5.2	10.4	2.59	2.59	4:1	2:1	2:1
CC - R6	6 - 7	61+88.00 - 72+85.43	37.9	21.3	4.7	5.9	0.30	2.37	16:1	2.5:1	92.4	32.0	10.7	5.3	5.3	10.7	2.67	2.67	4:1	2:1	2:1
CC - R7	7	72+85.43 - 77+49.20	38.6	21.5	4.8	6.0	0.30	2.39	16:1	2.5:1	94.1	32.3	10.8	5.4	5.4	10.8	2.69	2.69	4:1	2:1	2:1
CC - R8	7 - 9	77+49.20 - 108+29.04	40.5	22.0	4.9	6.1	0.31	2.45	16:1	2.5:1	98.7	33.1	11.0	5.5	5.5	11.0	2.76	2.76	4:1	2:1	2:1
CC - R9	9 - 10	108+29.04 - 145+78.66	42.4	22.6	5.0	6.3	0.31	2.51	16:1	2.5:1	103.4	33.8	11.3	5.6	5.6	11.3	2.82	2.82	4:1	2:1	2:1
CC-UT1-R1	11	10+00.00 - 22+64.79	9.4	10.6	2.4	3.0	0.15	1.18	16:1	2.5:1	22.9	15.9	5.3	2.7	2.7	5.3	1.33	1.33	4:1	2:1	2:1
CC-UT1-R2	11	22+64.79 - 26+37.00	10.8	11.4	2.5	3.2	0.16	1.26	16:1	2.5:1	26.3	17.1	5.7	2.8	2.8	5.7	1.42	1.42	4:1	2:1	2:1
CC-UT1-R3	11 - 12	26+37.00 - 36+65.05	11.3	11.6	2.6	3.2	0.16	1.29	16:1	2.5:1	27.5	17.5	5.8	2.9	2.9	5.8	1.46	1.46	4:1	2:1	2:1
CC-UT1-R3b	12	13+62.08 - 18+63.07	8.4	10.0	2.2	2.8	0.14	1.12	16:1	2.5:1	20.5	15.1	5.0	2.5	2.5	5.0	1.25	1.25	4:1	2:1	2:1
CC-UT1-R4	12	36+65.05 - 46+24.82	15.9	13.8	3.1	3.8	0.19	1.53	16:1	2.5:1	38.8	20.7	6.9	3.5	3.5	6.9	1.73	1.73	4:1	2:1	2:1
CC-UT1-R5-2	13	52+62.96 - 56+14.84	16.2	13.9	3.1	3.9	0.19	1.55	16:1	2.5:1	39.5	20.9	7.0	3.5	3.5	7.0	1.74	1.74	4:1	2:1	2:1
CC-UT1-R6	13, 4	56+14.84 - 77+04.41	18.4	14.9	3.3	4.1	0.21	1.65	16:1	2.5:1	44.9	22.3	7.4	3.7	3.7	7.4	1.86	1.86	4:1	2:1	2:1
CC-UT2-R1	16 - 17	10+00.00 - 33+80.72	9.0	10.4	2.3	2.9	0.14	1.15	16:1	2.5:1	21.9	15.6	5.2	2.6	2.6	5.2	1.30	1.30	4:1	2:1	2:1
CC-UT2-R2	17 - 18	33+80.72 - 48+98.01	9.4	10.6	2.4	3.0	0.15	1.18	16:1	2.5:1	22.9	15.9	5.3	2.7	2.7	5.3	1.33	1.33	4:1	2:1	2:1
CC-UT2-R2a-6	20	20+01.17 - 25+14.01	10.7	11.3	2.5	3.1	0.16	1.26	16:1	2.5:1	26.1	17.0	5.7	2.8	2.8	5.7	1.42	1.42	4:1	2:1	2:1
CC-UT2-R2a-7	20 - 21, 18	25+14.01 - 45+07.48	12.3	12.1	2.7	3.4	0.17	1.35	16:1	2.5:1	30.0	18.2	6.1	3.0	3.0	6.1	1.52	1.52	4:1	2:1	2:1
CC-UT2-R3	18	48+98.01 - 60+02.64	17.6	14.5	3.2	4.0	0.20	1.61	16:1	2.5:1	42.9	21.8	7.3	3.6	3.6	7.3	1.82	1.82	4:1	2:1	2:1
CC-UT2-R4	18 - 19	60+02.64 - 66+32.98	18.8	15.0	3.3	4.2	0.21	1.67	16:1	2.5:1	45.8	22.5	7.5	3.8	3.8	7.5	1.88	1.88	4:1	2:1	2:1
CC-UT2-R5	19, 4	66+32.98 - 83+90.01	19.3	15.2	3.4	4.2	0.21	1.69	16:1	2.5:1	47.0	22.8	7.6	3.8	3.8	7.6	1.90	1.90	4:1	2:1	2:1
CC-UT5	22, 6	10+00.00 - 26+33.47	7.1	9.2	2.1	2.6	0.13	1.03	16:1	2.5:1	17.3	13.8	4.6	2.3	2.3	4.6	1.15	1.15	4:1	2:1	2:1

**B, Bc, and STEP-POOL STREAM TYPE REPRESENTATIVE CROSS SECTION DIMENSIONS**

Stream	Sheet Range	Station Range	RIFFLES								POOLS					
			ABKF	WBKF	W1	W2	D1	D2	S1	S2	APOOL	WPOOL	W3	W4	D4	S3
CC-UT1-R1a	14, 11	10+00.00 - 22+55.73	3.2	6.2	1.4	1.7	0.09	0.7	16:1	2.5:1	7.1	9.3	1.2	4.0	1.34	3:1
CC-UT1-R1b	11	22+55.73 - 25+47.51	3.2	6.2	1.4	1.7	0.09	0.69	16:1	2.5:1	7.1	9.3	1.2	4.0	1.34	3:1
CC-UT1-R3a	12	10+00.00 - 13+62.08	7.4	9.4	2.1	2.6	0.13	1.05	16:1	2.5:1	16.4	14.1	1.9	6.1	2.04	3:1
CC-UT1-R3c	12	10+00.00 - 11+56.63	2.2	5.1	1.1	1.4	0.07	0.57	16:1	2.5:1	4.9	7.7	1.0	3.3	1.11	3:1
CC-UT1-R5-1	12 - 13	46+24.82 - 52+62.96	16.2	13.9	3.1	3.9	0.19	1.55	16:1	2.5:1	35.8	20.9	2.8	9.1	3.02	3:1
CC-UT1-R5a	15, 13	10+00.00 - 29+54.41	5.0	7.7	1.7	2.2	0.11	0.86	16:1	2.5:1	11.1	11.6	1.5	5.0	1.68	3:1
CC-UT3	5	10+00.00 - 10+98.36	2.7	5.7	1.3	1.6	0.08	0.63	16:1	2.5:1	6.0	8.5	1.1	3.7	1.23	3:1
CC-UT4	5	10+00.00 - 11+68.28	2.1	5.0	1.1	1.4	0.07	0.56	16:1	2.5:1	4.6	7.5	1.0	3.3	1.09	3:1
CC-UT6	7	10+00.00 - 14+76.97	3.2	6.2	1.4	1.7	0.09	0.69	16:1	2.5:1	7.1	9.3	1.2	4.0	1.34	3:1
CC-UT7	23 - 24, 7	10+00.00 - 33+28.29	4.9	7.7	1.7	2.1	0.11	0.85	16:1	2.5:1	10.8	11.5	1.5	5.0	1.66	3:1

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ENROEE RANGER DISTRICT  
STREAM AND RIPARIAN RESTORATION/  
ENHANCEMENT PROJECT  
CLARKS CREEK WATERSHED  
CHESTER COUNTY, SOUTH CAROLINA

PREPARED IN THE OFFICE OF:

1150 SE MAYNARD RD, SUITE 140  
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LICENSE # 5371

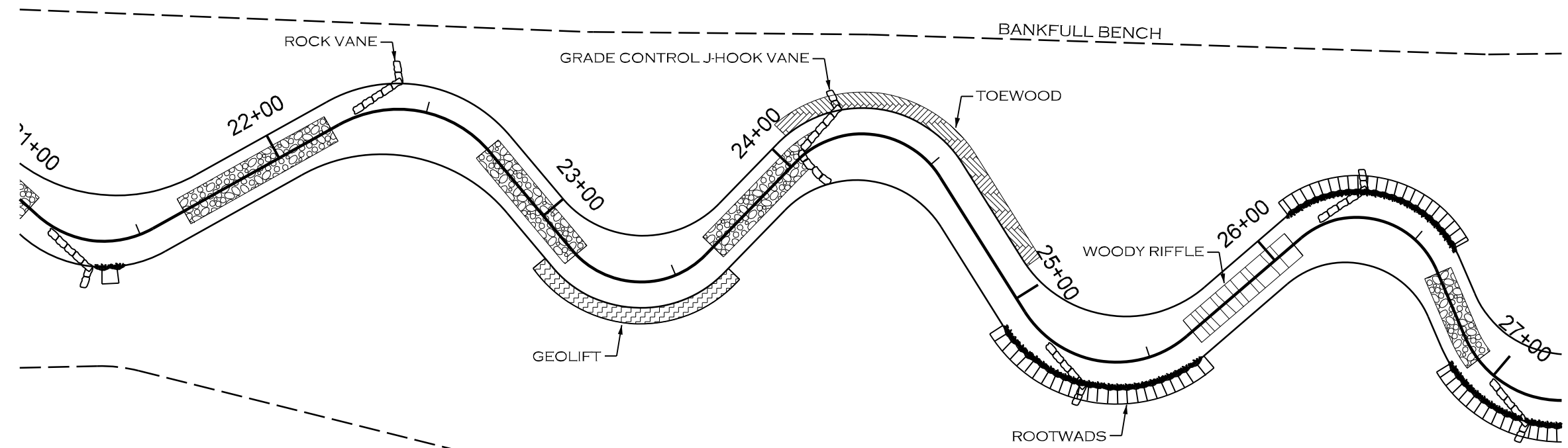
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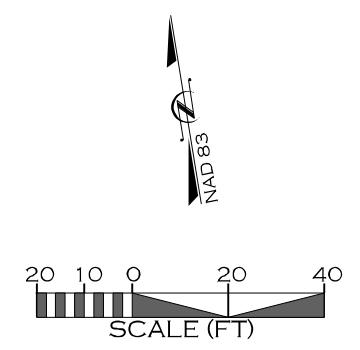


TYPICAL STRUCTURE PLACEMENT  
MEANDERING CHANNEL DESIGN

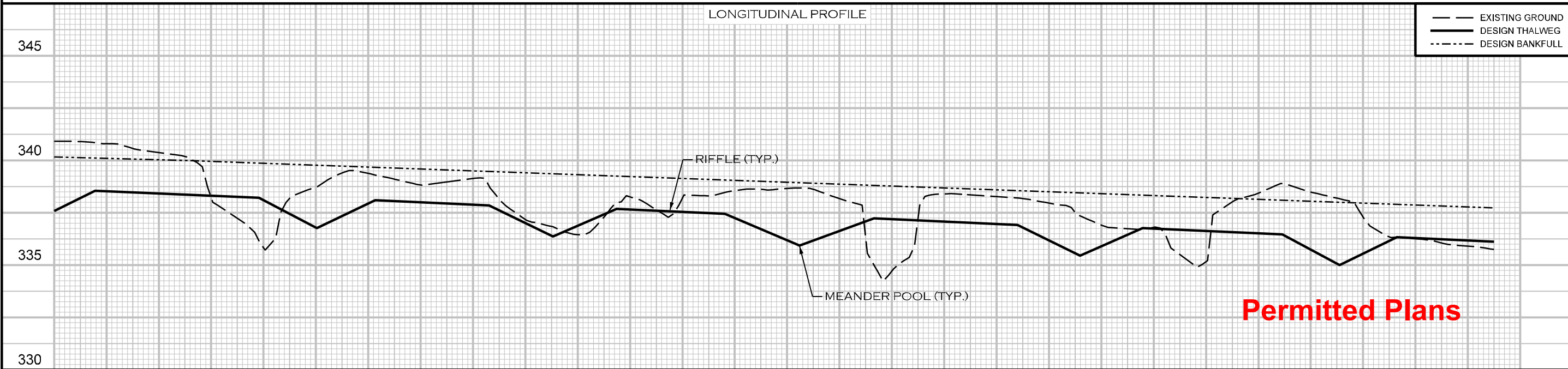


NOTES:

1. THIS DETAIL ILLUSTRATES TYPICAL PLACEMENT OF IN-STREAM AND BANK PROTECTION STRUCTURES TO BE USED IN MEANDERING CHANNEL DESIGNS. PLACEMENT AND TYPES OF STRUCTURES MAY VARY.
2. MEANDERING CHANNEL STRUCTURES ARE TYPICALLY USED FOR BANK PROTECTION, HABITAT, AND GRADE CONTROL, AND TYPICALLY FOR REACHES EQUAL TO OR LESS THAN 1.5% SLOPE.
3. GRADE CONTROL STRUCTURES SHALL BE PLACED TO PREVENT PIPING, EXCESSIVE SCOUR, AND STREAM INCISION AROUND STRUCTURE.
4. SEE DETAILS FOR SPECIFIC STRUCTURES FOR MORE INFORMATION.



LONGITUDINAL PROFILE



21+50      22+00      23+00      24+00      25+00      26+00      27+00

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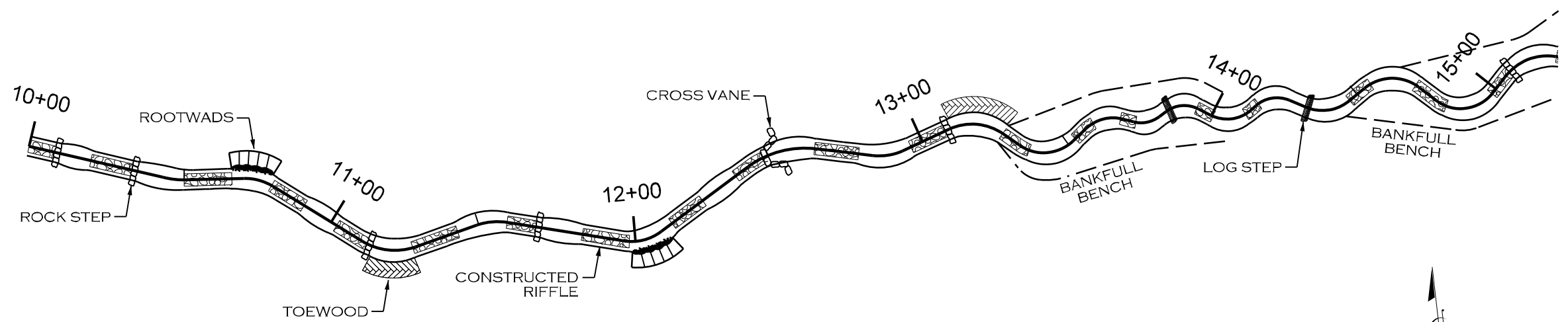
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TYPICAL STRUCTURE PLACEMENT  
STEP - POOL CHANNEL DESIGN

PROJECT #  
EPRO002

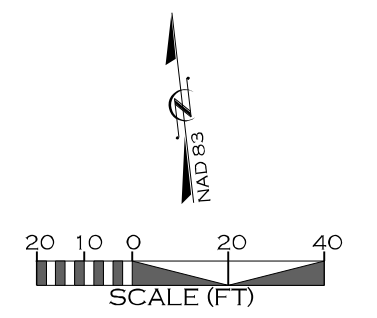
SHEET NO.  
2B

DETAILS

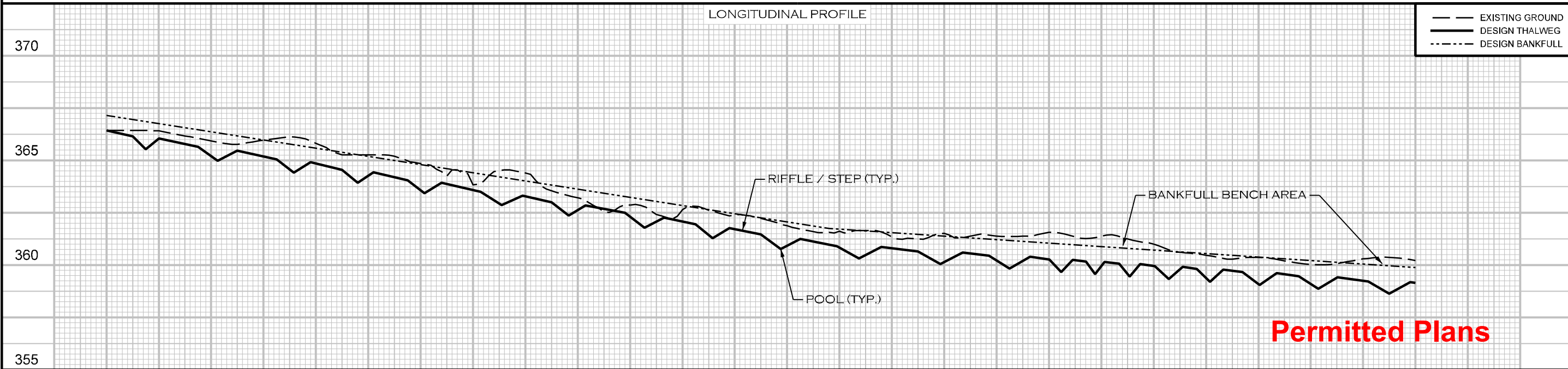


NOTES:

1. THIS DETAIL ILLUSTRATES TYPICAL PLACEMENT OF IN-STREAM AND BANK PROTECTION STRUCTURES TO BE USED IN STEP-POOL CHANNEL DESIGNS. PLACEMENT AND TYPES OF STRUCTURES MAY VARY.
2. STEP-POOL STRUCTURES ARE TYPICALLY USED FOR REACHES WITH SLOPES IN EXCESS OF 1.5%.
3. GRADE CONTROL STRUCTURES SHALL BE PLACED TO PREVENT PIPING, EXCESSIVE SCOUR, AND STREAM INCISION AROUND STRUCTURE
4. SEE DETAILS FOR SPECIFIC STRUCTURES FOR MORE INFORMATION.



LONGITUDINAL PROFILE



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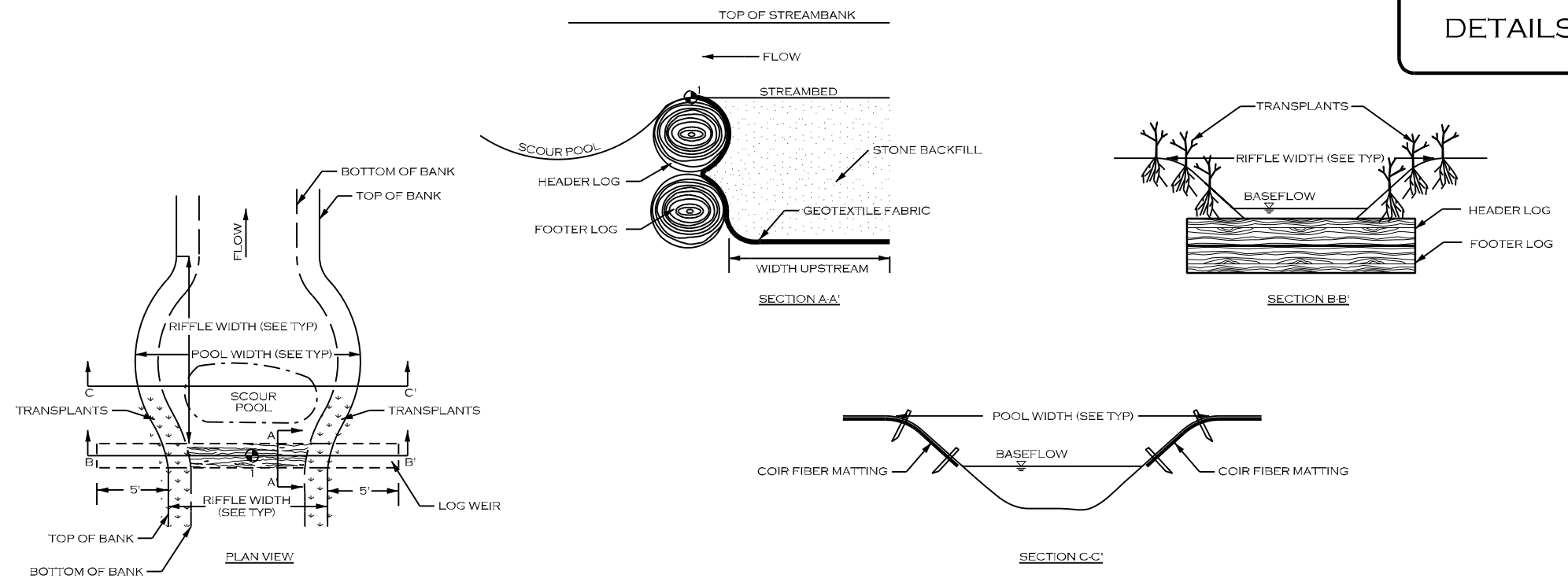
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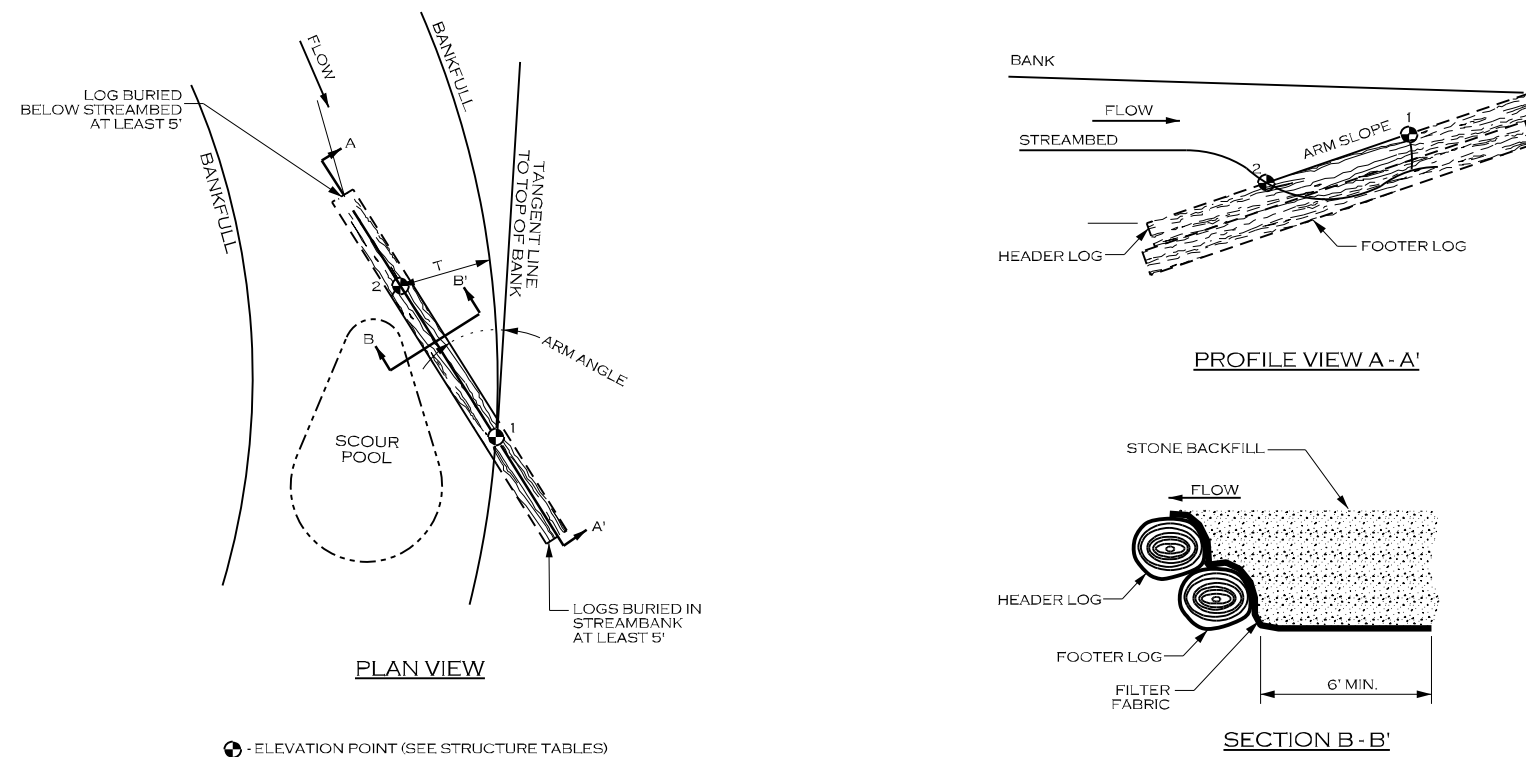
⊙ - ELEVATION POINT (SEE STRUCTURES TABLE)

LOG STEP SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
LOGS	TYPE: HARDWOOD SIZE: 20 FT LONG, 12 INCH Ø MIN NUMBER OF HEADER LOGS: 1 NUMBER OF FOOTER LOGS: 1
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
<b>NOTES FOR LOG STEP STRUCTURES:</b> 1. LOGS SHOULD BE AT LEAST 12 INCHES IN DIAMETER, RELATIVELY STRAIGHT, HARDWOOD, AND RECENTLY HARVESTED. 2. LOGS >24 INCHES IN DIAMETER MAY BE USED ALONE WITHOUT AN ADDITIONAL LOG. GEOTEXTILE FABRIC SHOULD STILL BE USED TO SEAL AROUND LOG. 3. PLACE FOOTER LOGS FIRST AND THEN HEADER (TOP) LOG. SET HEADER LOG APPROXIMATELY 3 INCHES ABOVE THE INVERT ELEVATION. 4. CUT A NOTCH IN THE HEADER LOG APPROXIMATELY 50 PERCENT OF THE CHANNEL BOTTOM WIDTH AND EXTENDING DOWN TO THE INVERT ELEVATION. 5. USE GEOTEXTILE FABRIC TO SEAL GAPS BETWEEN LOGS. 6. PLACE TRANSPLANTS FROM TOE OF STREAMBANK TO TOP OF STREAMBANK. 7. TRANSPLANTS CAN BE SUBSTITUTED WITH LIVE STAKES AT THE DIRECTION OF THE ENGINEER.	



LOG VANE (LV)

LOG VANE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
LOGS	TYPE: HARDWOOD SIZE: SEE NOTES. NUMBER OF HEADER LOGS: 1 NUMBER OF FOOTER LOGS: 1
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
STONE BACKFILL	CLASS A AND 57 STONE (50/50 MIX)
<b>NOTES FOR LOG VANE STRUCTURES:</b> 1. STRUCTURE DIMENSIONS AND STRUCTURE MEASUREMENTS ARE SHOWN ON THE STRUCTURE TABLES SHEET. 2. LOGS SHOULD BE STRAIGHT, HARDWOOD, AND NOT ROTTEN. 3. SOIL SHOULD BE COMPACTED WELL AROUND BURIED PORTIONS OF LOGS. 4. FILTER FABRIC SHOULD BE NAILED TO THE LOG BELOW THE BACKFILL. 5. LOGS 12 INCH DIAMETER MINIMUM.	



⊙ - ELEVATION POINT (SEE STRUCTURE TABLES)

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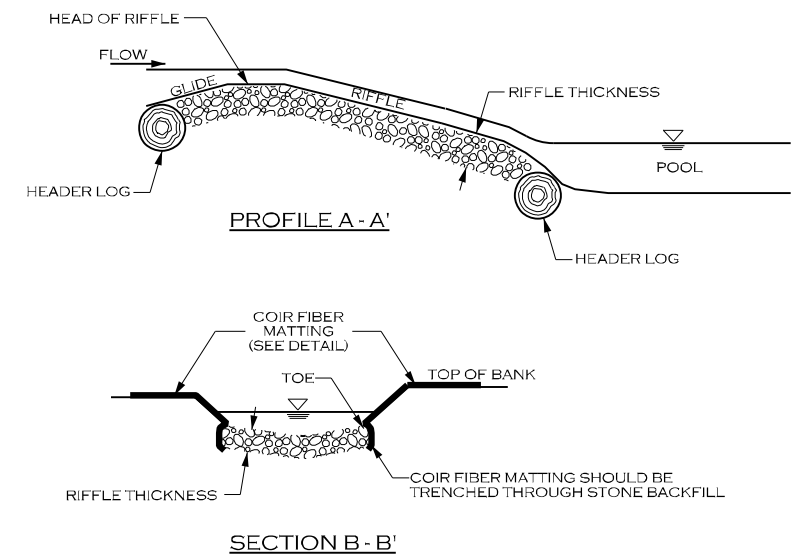
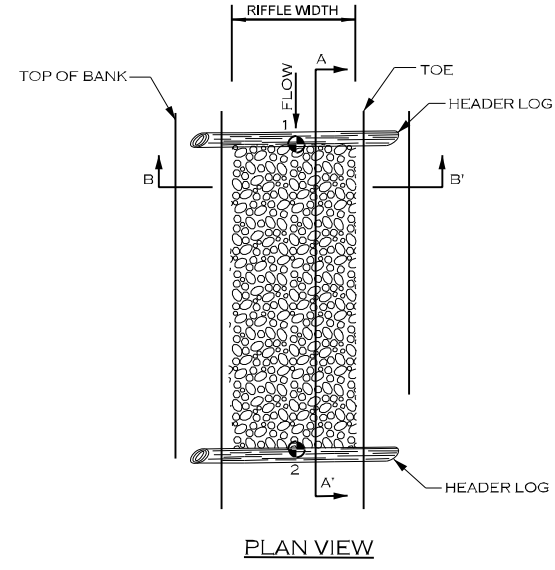
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DETAILS

CONSTRUCTED RIFFLE (CR)



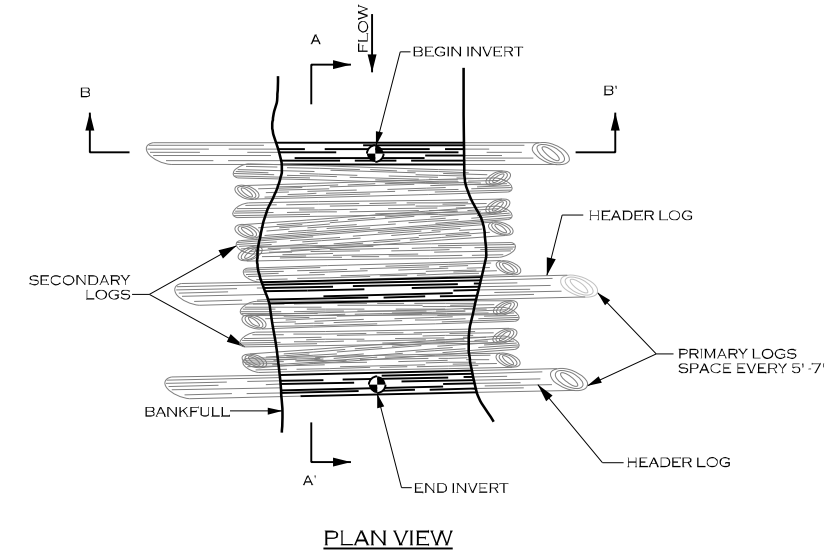
• ELEVATION POINT (SEE STRUCTURES TABLE)

CONSTRUCTED RIFFLE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
STONE BACKFILL	TYPE: GRANITE OR COMPARABLE SIZE: CLASS A AND CLASS B STONE (50/50 MIX) THICKNESS: 16 INCHES MIN.
COIR FIBER MATTING	SEE MATTING DETAIL

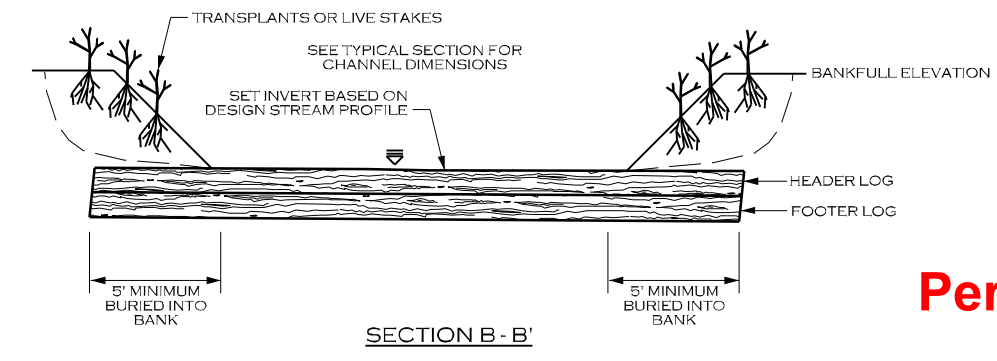
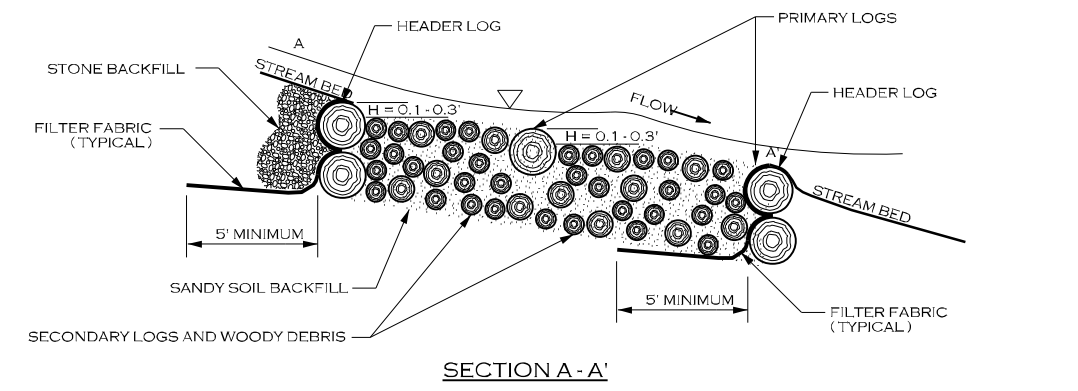
NOTES FOR CONSTRUCTED RIFFLE STRUCTURES:

- GRADE STREAMBED AND BANKS TO PROPOSED DIMENSIONS PER TYPICAL CROSS SECTION AND PROFILE.
- EXCAVATE TRENCH BELOW PROPOSED STREAMBED ELEVATION EQUAL TO OR GREATER THAN RIFFLE THICKNESS.
- INSTALL COIR FIBER MATTING ALONG STREAMBANKS ENSURING MATTING IS SUFFICIENTLY TRENCHED ALONG TOP OF BANK.
- FILL TRENCH WITH STONE TO FINAL DESIGN STREAM GRADE.

GRADE CONTROL WOODY RIFFLE (WR)



• ELEVATION POINT (SEE STRUCTURES TABLE)



- NOTES:
- PRIMARY LOGS SHOULD BE AT LEAST 10" OR MORE IN DIAMETER, RELATIVELY STRAIGHT, AND RECENTLY HARVESTED AND EXTENDING INTO THE BANK 5' ON EACH SIDE.
  - SECONDARY LOGS SHOULD BE AT LEAST 1" IN DIAMETER AND NO LARGER THAN 10", AND EXTEND INTO THE BANK 2 FEET ON EACH SIDE. WOOD MATERIAL SHALL BE VARYING DIAMETER TO ALLOW MATERIAL TO BE COMPACTED.
  - FILTER FABRIC SHOULD BE NAILED TO THE HEADER LOG BELOW THE BACKFILL.
  - ROOTWADS AND COIR FIBER MATTING CAN BE USED INSTEAD OF TRANSPLANTS OR LIVE STAKES, PER DIRECTION OF ENGINEER.
  - AFTER TRENCH HAS BEEN EXCAVATED A LAYER OF SECONDARY LOGS AND WOODY DEBRIS SHOULD BE PLACED WITH MINIMAL GAPS. A LAYER OF ON-SITE ALLUVIUM SHOULD BE APPLIED TO FILL VOIDS BETWEEN SECONDARY LOGS BEFORE ADDITIONAL LAYERS ARE PLACED.

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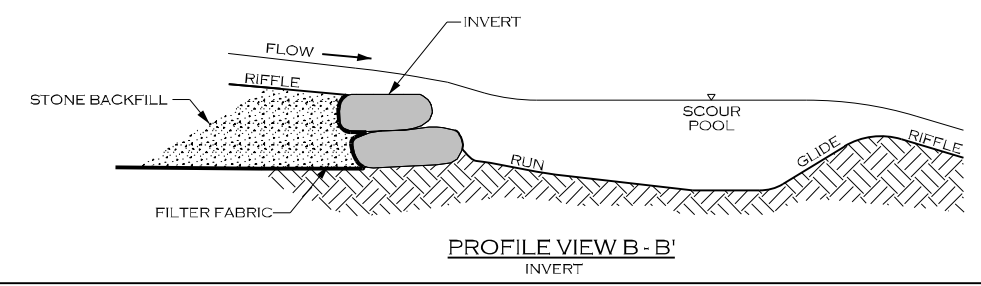
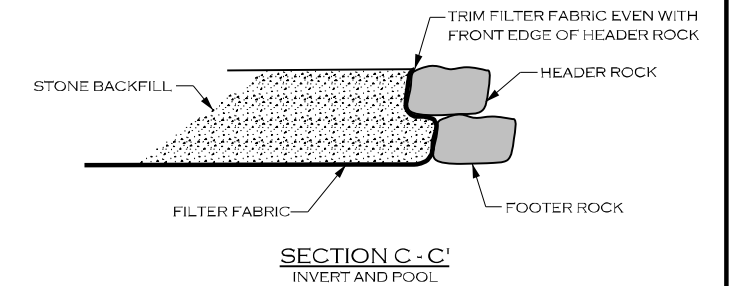
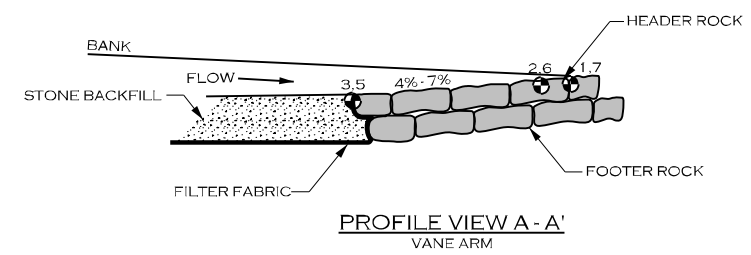
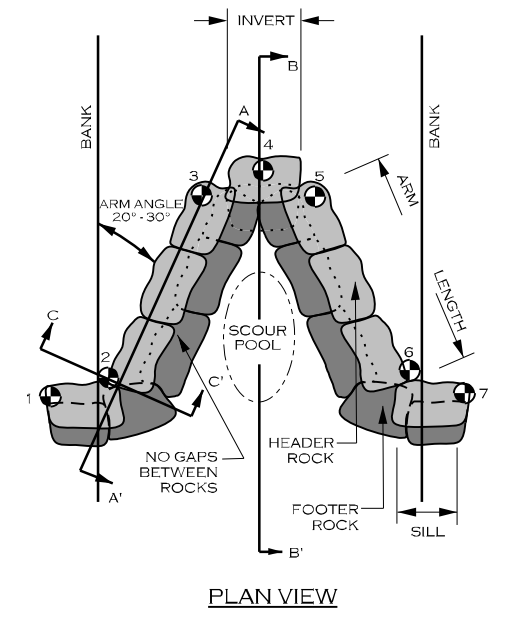
DETAILS

⊙ - ELEVATION POINT (SEE STRUCTURE TABLES)

ROCK CROSS VANE SPECIFICATIONS		
MATERIALS:	SPECIFICATIONS:	
BOULDER	TYPE: GRANITE OR COMPARABLE SIZE: 3 x 2 x 2 FT NUMBER OF HEADER ROWS: 1 NUMBER OF FOOTER ROWS: 1	
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM	
STONE BACKFILL	CLASS A AND 57 STONE (50/50 MIX)	

**NOTES FOR CROSS VANE STRUCTURES:**

- STRUCTURE DIMENSIONS AND MEASUREMENTS ARE SHOWN ON THE STRUCTURE TABLES.
- DIG A TRENCH BELOW THE STREAM BED FOR FOOTER AND HEADER ROCKS, FILTER FABRIC AND STONE BACKFILL.
- PLACE FOOTER ROCKS AND THEN HEADER ROCKS TO ACHIEVE DESIGN DIMENSIONS AND ELEVATIONS.
- USE HAND PLACED STONE TO FILL GAPS AND VOIDS ON UPSTREAM SIDE OF THE HEADER AND FOOTER ROCKS.
- PLACE FILTER FABRIC BEGINNING AT THE TOP OF THE HEADER ROCKS AND EXTENDING DOWN TO THE DEPTH OF THE FOOTER ROCKS, THEN OUTWARD THE DISTANCE SPECIFIED ABOVE (FILTER FABRIC WIDTH UPSTREAM).
- INSTALL STONE BACKFILL OVER FILTER FABRIC AS SHOWN.
- AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ONSITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.

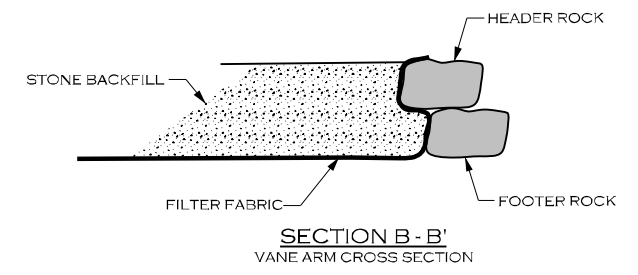
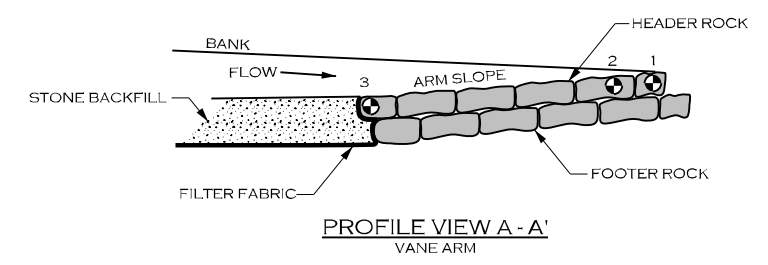
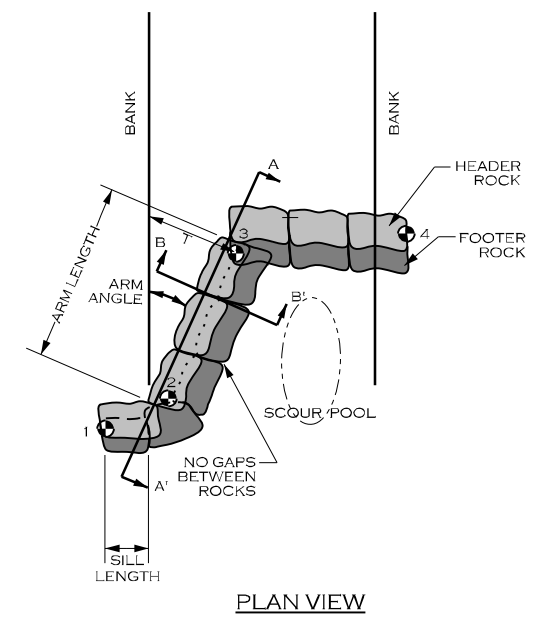


GRADE CONTROL J-HOOK VANE (RJH)

GRADE CONTROL J-HOOK VANE SPECIFICATIONS		
MATERIALS:	SPECIFICATIONS:	
BOULDER	TYPE: GRANITE OR COMPARABLE SIZE: 3 x 2 x 2 FT NUMBER OF HEADER ROWS: 1 NUMBER OF FOOTER ROWS: 1	
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM	
STONE BACKFILL	CLASS A AND 57 STONE (50/50 MIX)	

**NOTES FOR GRADE CONTROL J-HOOK VANE:**

- STRUCTURE DIMENSIONS AND MEASUREMENTS ARE SHOWN ON THE STRUCTURES TABLE SHEET.
- INSTALL FILTER FABRIC BEGINNING AT THE TOP OF THE HEADER ROCKS AND EXTEND DOWNWARD TO THE DEPTH OF THE BOTTOM FOOTER ROCK, AND THEN UPSTREAM TO A MINIMUM OF TEN FEET.
- DIG A TRENCH BELOW THE BED FOR FOOTER ROCKS AND PLACE FILL ON UPSTREAM SIDE OF VANE ARM, BETWEEN THE ARM AND STREAMBANK.
- START AT BANK AND PLACE FOOTER ROCKS FIRST AND THEN HEADER (TOP) ROCK.
- USE HAND PLACED STONE TO FILL GAPS ON UPSTREAM SIDE OF HEADER AND FOOTER ROCKS.
- INSTALL STONE BACKFILL AS SHOWN, TO THE DIMENSIONS INDICATED IN THE STRUCTURES TABLE SHEET.
- AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ONSITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.



⊙ - ELEVATION POINT (SEE STRUCTURES TABLE)

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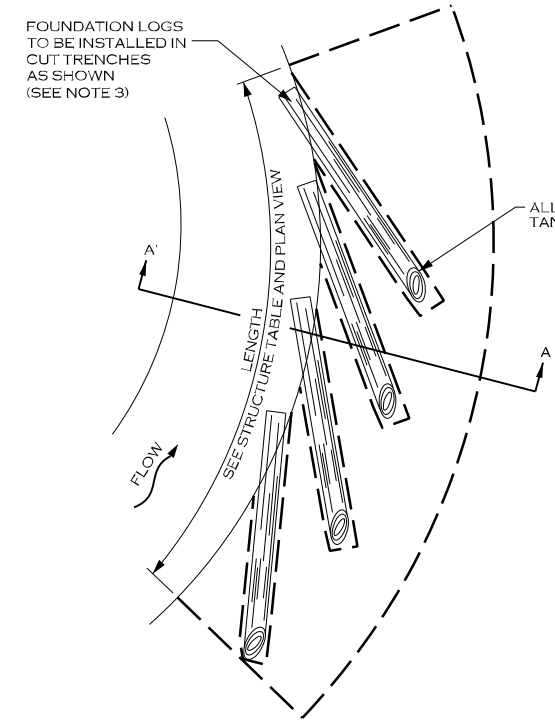
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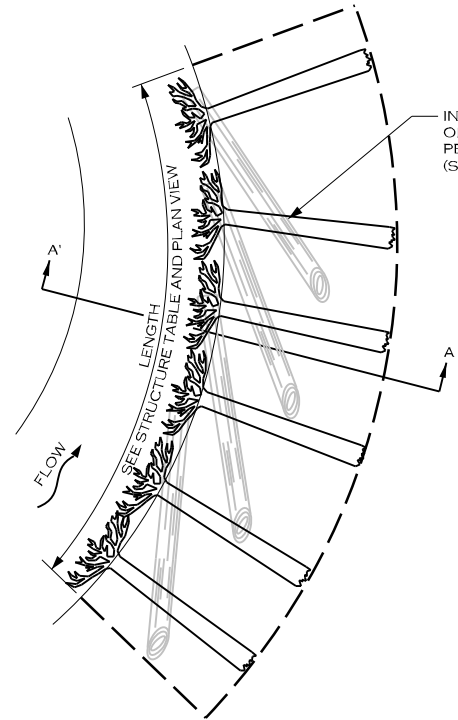
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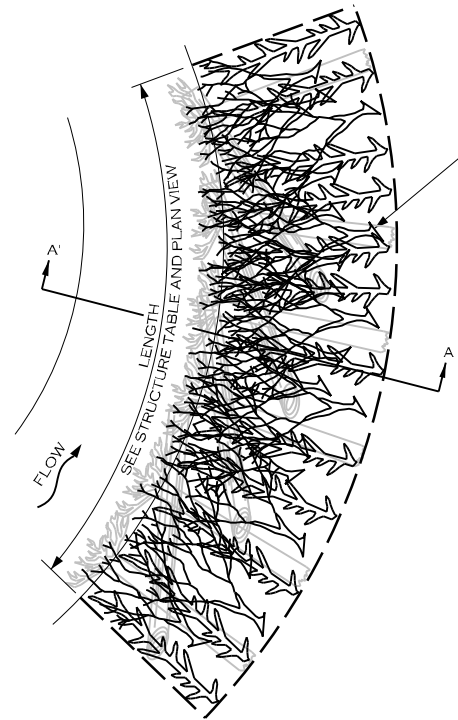
TOE WOOD WITH GEOLIFT <sup>(TW)</sup>



PLAN VIEW - 1  
FOUNDATION LOG INSTALLATION

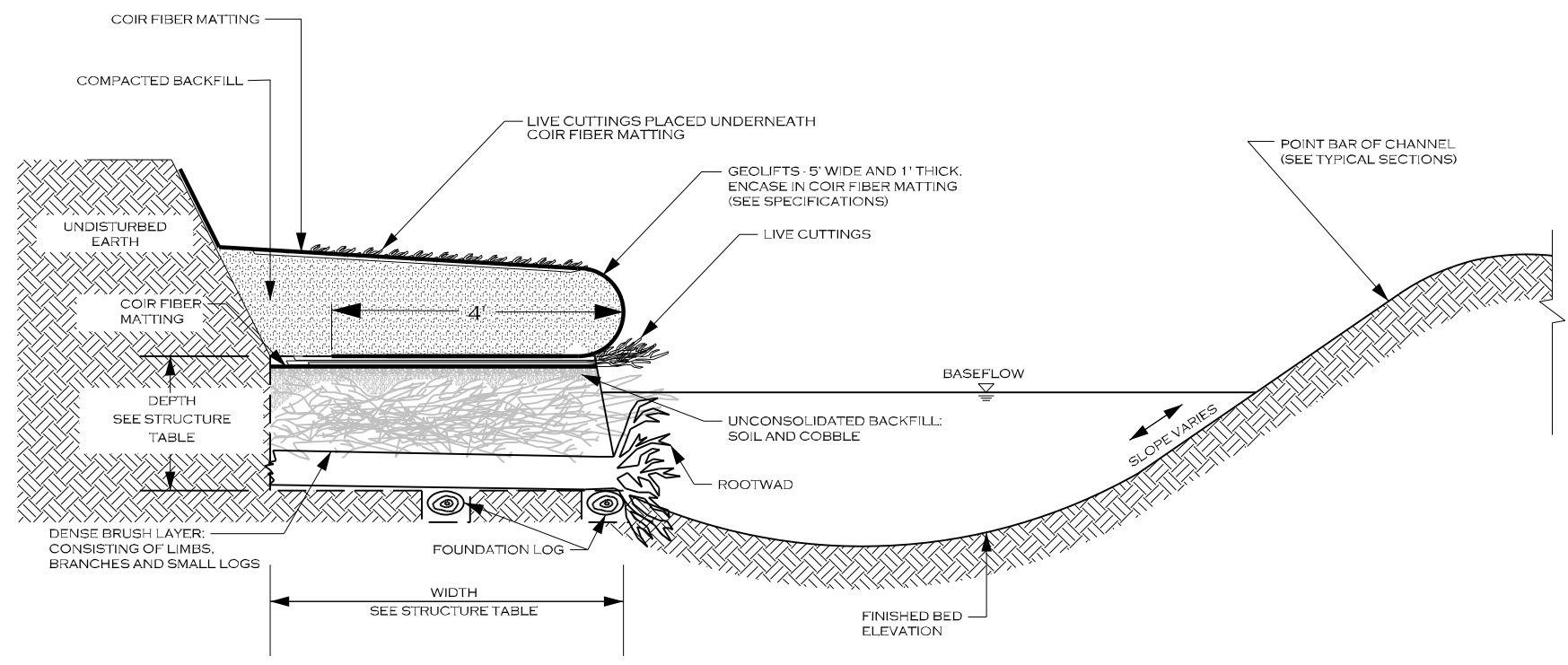


PLAN VIEW - 2  
ROOTWAD INSTALLATION



PLAN VIEW - 3  
BRUSH LAYER INSTALLATION

Permitted Plans



SECTION VIEW

TOE WOOD SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
BRUSH MATERIAL	TYPE: BRUSH MATERIAL SIZE: 5 FT LONG, 1 INCH DIAMETER
ROOTWAD MATERIAL	TYPE: HARDWOOD SIZE: 6 FT - 10 FT LONG MIN, 12 INCH DIAMETER
FOUNDATION LOGS	TYPE: HARDWOOD SIZE: 6 FT - 10 FT LONG MIN, 12 INCH DIAMETER
COIR FIBER MATTING	TYPE: NETTING (SEE SPECIFICATIONS)

**NOTES FOR TOE WOOD STRUCTURES:**

- DIG A TRENCH ALONG BANK WHERE TOE WOOD IS TO BE INSTALLED, TO THE DEPTH AND WIDTH SPECIFIED IN THE DETAILS AND STRUCTURE TABLE. IF TOE WOOD IS BEING PLACED IN A LOCATION WHERE THERE IS NOT EXISTING GROUND, PLACE FILL MATERIAL AND COMPACT TO FORM THE TRENCH FOR THE TOE WOOD MATERIALS.
- FOUNDATION LOGS SHALL MEET THE MINIMUM DIAMETER LISTED ABOVE, AND BE STRAIGHT, HARDWOOD, AND NOT ROTTEN. EXCAVATE TRENCH BELOW TOEWOOD GRADE FOR FOUNDATION LOG INSTALLATION. PLACE FOUNDATION LOGS AS SHOWN IN THE PLAN VIEW 1 TO FORM A FOUNDATION FOR THE TOE WOOD MATERIALS TO LAY UPON. THE ANGLE BETWEEN THE TANGENT LINE OF THE BANK AND THE UPSTREAM FACE OF THE FOUNDATION LOG SHALL BE BETWEEN 20 TO 30 DEGREES.
- INSTALL ROOTWADS ON TOP OF FOUNDATION LOGS, PERPENDICULAR TO THE FLOW AS SHOWN IN PLAN VIEW 2.
- INSTALL BRUSH MATERIAL INCLUDING BRANCHES, LOGS, AND BRUSH, AND AT LEAST 1" IN DIAMETER. LARGE MATERIALS AND SMALL MATERIALS SHALL BE MIXED, PLACED IN LAYERS NO MORE THAN 1 FOOT DEEP, COVERED IN A THIN LAYER OF ONSITE ALLUVIUM, AND COMPACTED BEFORE PLACING THE NEXT LAYER OF TOE WOOD MATERIAL. CONTINUE PLACING MATERIALS TO FORM A DENSE LAYER OF WOODY MATERIALS AND ONSITE ALLUVIUM TO THE DEPTH AND ELEVATIONS SPECIFIED (PLAN VIEW 3).
- PLACE AN UNCONSOLIDATED LAYER OF SOIL AND COBBLE ON TOP OF BRUSH LAYER.
- COVER SOIL AND COBBLE LAYER IN COIR FIBER MATTING.
- INSTALL LIVE CUTTINGS, INCLUDING BRANCHES AND BRUSH, AT LEAST 5 FEET IN LENGTH, AND AT LEAST 1 INCH IN DIAMETER.
- CONSTRUCT GEOLIFTS OR PLACE TRANSPLANTS (AS SPECIFIED OR DIRECTED BY THE ENGINEER) TO REBUILD THE STREAMBANK ABOVE THE TOE WOOD LAYER.

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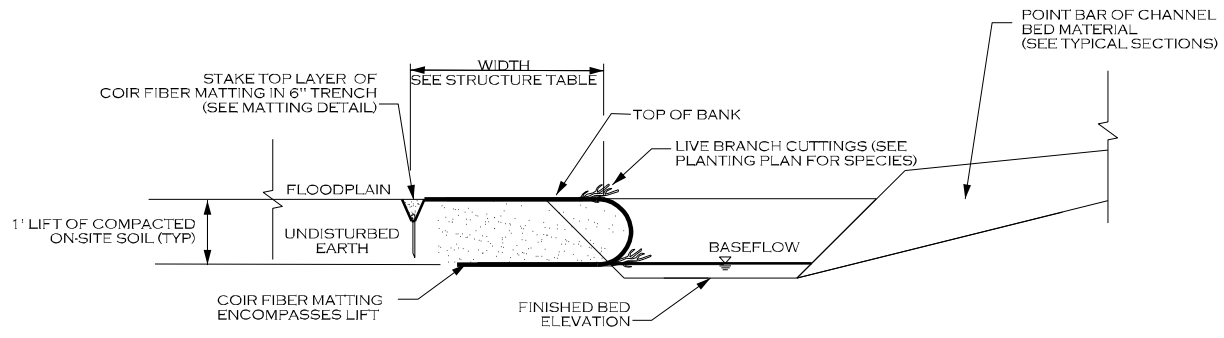
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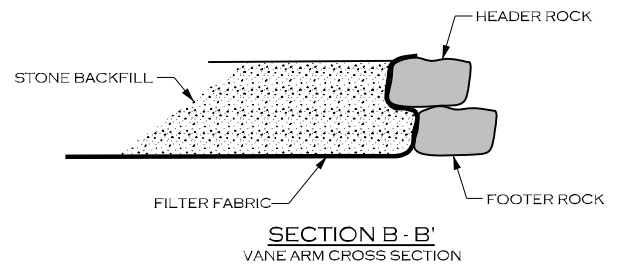
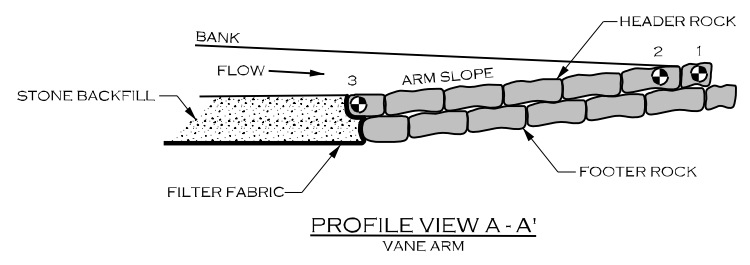
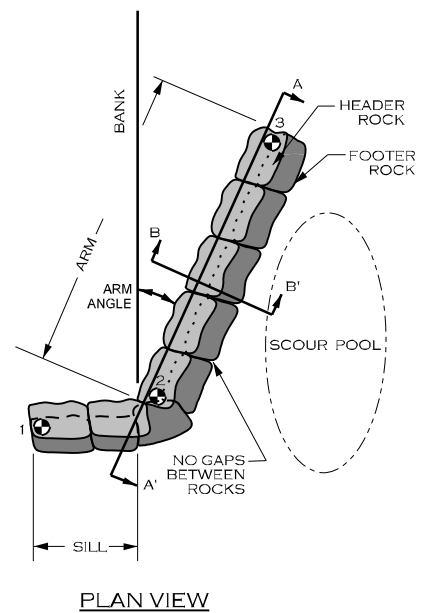
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ROCK VANE (RV)



ROCK VANE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
BOULDER	TYPE: GRANITE OR COMPARABLE SIZE: 3 FT X 2 FT X 2 FT NUMBER OF HEADER ROWS: 1 NUMBER OF FOOTER ROWS: 1
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
<b>NOTES FOR ROCK VANE STRUCTURES:</b>	
1. STRUCTURE DIMENSIONS AND MEASUREMENTS ARE SHOWN ON THE STRUCTURES TABLE SHEET.	
2. DIG A TRENCH BELOW THE STREAM BED FOR FOOTER AND HEADER ROCKS, FILTER FABRIC AND STONE BACKFILL.	
3. PLACE FOOTER ROCKS AND THEN HEADER ROCKS TO ACHIEVE DESIGN DIMENSIONS AND ELEVATIONS.	
4. USE HAND PLACED STONE TO FILL GAPS AND VOIDS ON UPSTREAM SIDE OF THE HEADER AND FOOTER ROCKS.	
5. PLACE FILTER FABRIC BEGINNING AT THE TOP OF THE HEADER ROCKS AND EXTENDING DOWN TO THE DEPTH OF THE FOOTER ROCKS, THEN OUTWARD THE DISTANCE SPECIFIED IN THE STRUCTURES TABLE SHEET.	
6. INSTALL STONE BACKFILL AND ONSITE ALLUVIUM AS SHOWN, TO THE DIMENSIONS INDICATED IN THE STRUCTURES TABLE SHEET.	
7. AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ONSITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.	

● ELEVATION POINT (SEE STRUCTURES TABLE)

Permitted Plans

REVISIONS				
NO.	DESCRIPTION	ENGR.	APPROV.	DATE
1	PERMITTING DESIGN PLANS	EB	KLT	10/25/23

PREPARED FOR:

SC DEPARTMENT OF COMMERCE FOR SCOUT MOTORS

SUMTER NATIONAL FOREST  
ENROEE RANGER DISTRICT  
STREAM AND RIPARIAN RESTORATION/  
ENHANCEMENT PROJECT  
CLARKS CREEK WATERSHED  
CHESTER COUNTY, SOUTH CAROLINA

PREPARED IN THE OFFICE OF:

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LICENSE # 5371

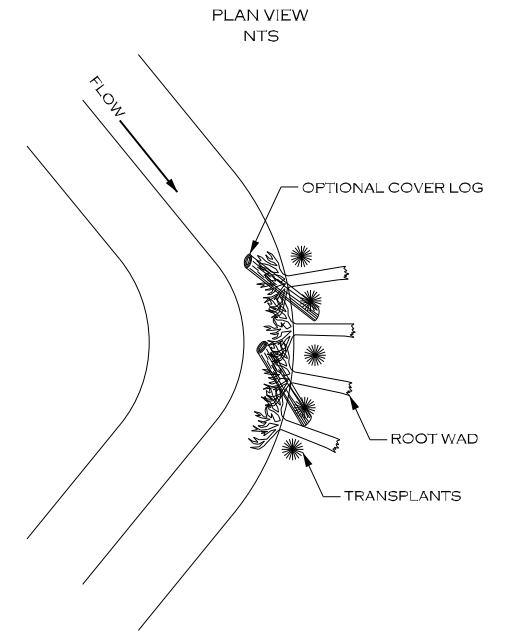
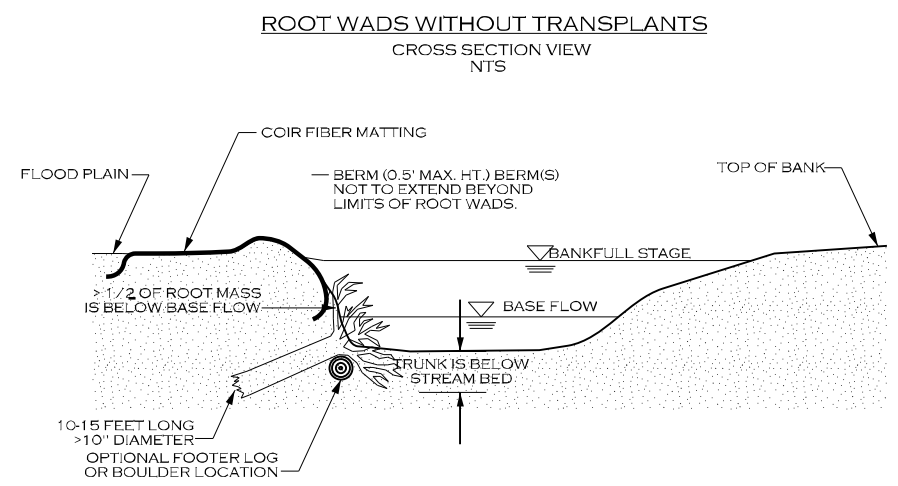
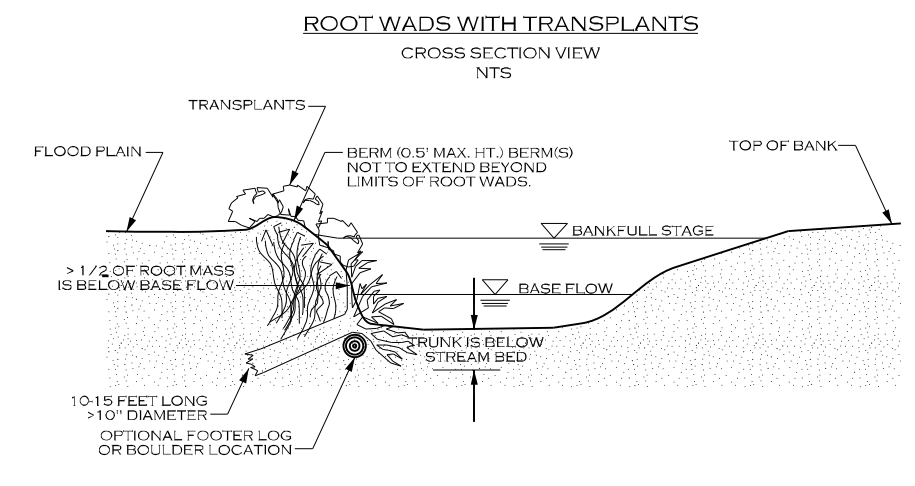
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DETAILS

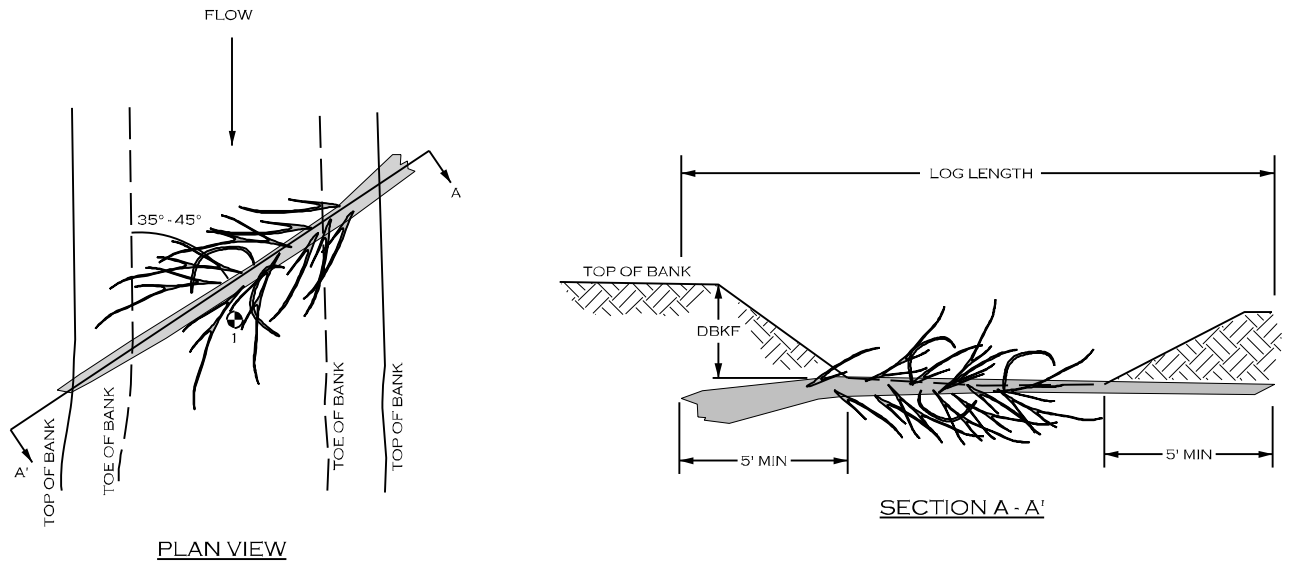
ROOTWAD (RW)



NOTES:  
 TRENCHING METHOD:  
 IF THE ROOT WAD CANNOT BE DRIVEN INTO THE BANK OR THE BANK NEEDS TO BE RECONSTRUCTED, THE TRENCHING METHOD SHOULD BE USED. THIS METHOD REQUIRES THAT A TRENCH BE EXCAVATED FOR THE LOG PORTION OF THE ROOT WAD. IN THIS CASE, A FOOTER LOG SHOULD BE INSTALLED UNDERNEATH THE ROOT WAD IN A TRENCH EXCAVATED PARALLEL TO THE BANK AND WELL BELOW THE STREAMBED. ONE-THIRD OF THE ROOT WAD SHOULD REMAIN BELOW NORMAL BASE FLOW CONDITIONS.

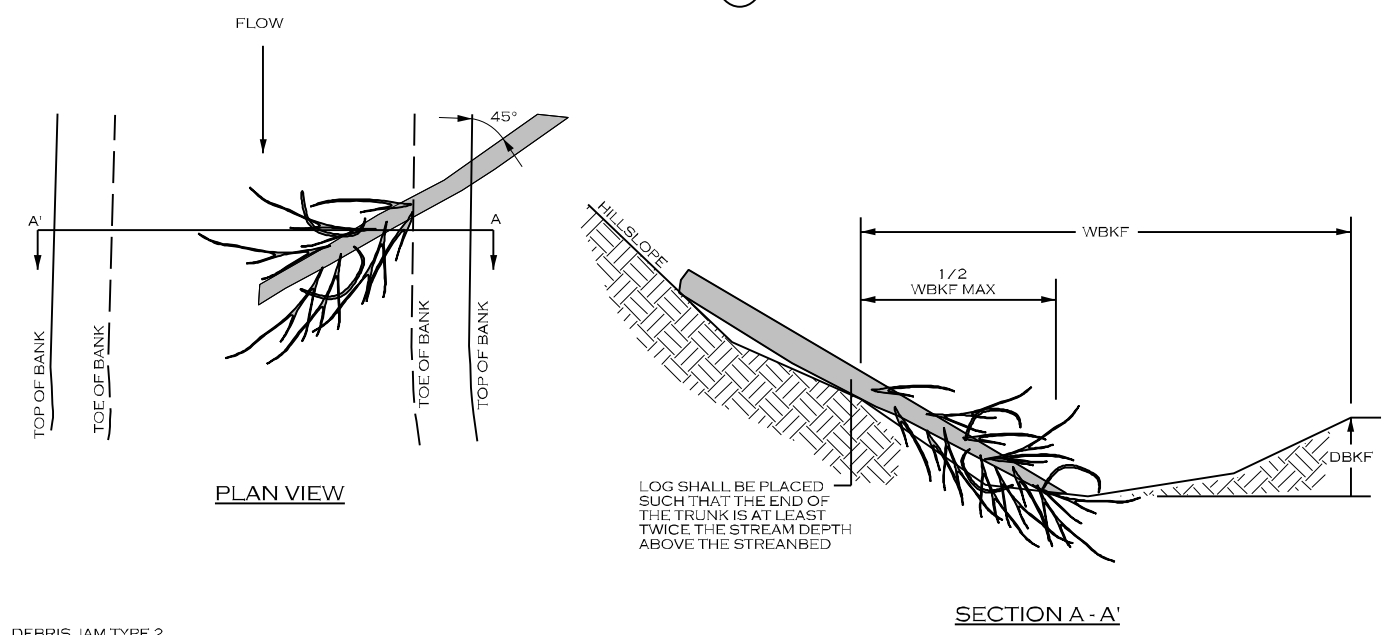
NOTES:  
 DRIVE POINT METHOD:  
 SHARPEN THE END OF THE LOG WITH A CHAINSAW BEFORE "DRIVING" IT INTO THE BANK. ORIENT ROOT WADS AS SHOWN, DEFLECTING THE WATER AWAY FROM THE BANK. A TRANSPLANT SHOULD BE PLACED ON THE DOWNSTREAM SIDE OF THE ROOT WAD IF A BACK EDDY IS FORMED BY THE ROOT WAD.

DEBRIS JAM TYPE 1 (DJ T-1)



- DEBRIS JAM TYPE 1
1. DEBRIS JAM TYPE 1 INSTALLATIONS SHALL BE PLACED WITHIN STREAM RIFFLES TO TRAP DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH FLOWING, AERATED WATER.
  2. TREE SHALL BE ANY NON-EVERGREEN TREE WITH BRANCHES, AT LEAST 8 INCHES DIAMETER, AND NOT ROTTEN.
  3. TREE SHALL HAVE CONSIDERABLE NUMBER OF BRANCHES THAT REMAIN EXPOSED AFTER INSTALLATION AND IN CONTACT WITH THE STREAM FLOW TO TRAP LEAVES AND DETRITUS FROM STREAM FLOW.
  4. TREE SHALL BE INSTALLED SO THAT THE TRUNK IS LEVEL WITH THE BED ELEVATION OF THE STREAM, SUCH THAT THE TRUNK DOES NOT POOL WATER IN FRONT OF THE STRUCTURE. BACKFILL AND COMPACT AROUND THE TRUNK AND INSTALLED TREE TO MINIMIZE VOIDS.

DEBRIS JAM TYPE 2 (DJ T-2)



- DEBRIS JAM TYPE 2
1. DEBRIS JAM TYPE 2 INSTALLATIONS SHALL BE PLACED AREAS WHERE THE STREAM FLOWS AGAINST A STEEP SLOPE. A TREE IS INSTALLED AS SHOWN TO CATCH DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH STREAM FLOWS. THIS DEBRIS JAM MAY BE INSTALLED IN RIFFLE OR POOL LOCATIONS.
  2. TREE SHALL BE ANY NON-EVERGREEN TREE WITH BRANCHES, AT LEAST 8 INCHES DIAMETER, AND NOT ROTTEN.
  3. TREE SHALL HAVE CONSIDERABLE NUMBER OF BRANCHES THAT REMAIN EXPOSED AND IN CONTACT WITH THE STREAM FLOW AFTER INSTALLATION TO TRAP LEAVES AND DETRITUS FROM STREAM FLOW.
  4. TREE SHALL BE INSTALLED SO THAT THE TRUNK LIES UPON THE HILL SLOPE, AND IS ANCHORED TO THE HILLSLOPE TO PREVENT MOVEMENT DURING LARGE STREAM FLOWS. TREE SHALL BE CABLED TO A FRESHLY CUT STUMP OR ANOTHER LIVE TREE OF AT LEAST THE SAME SIZE.

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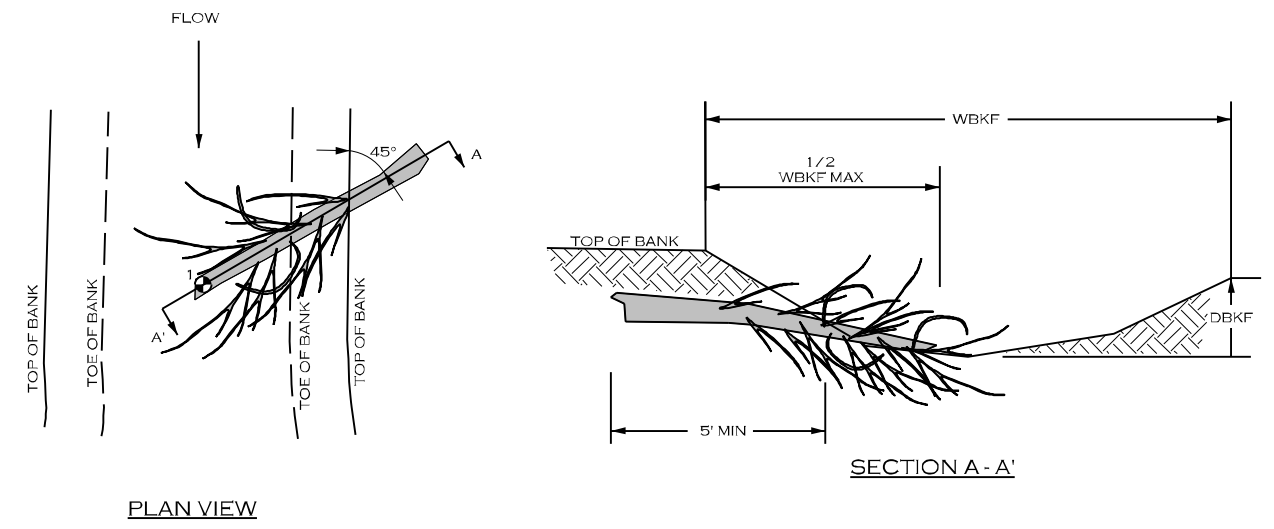
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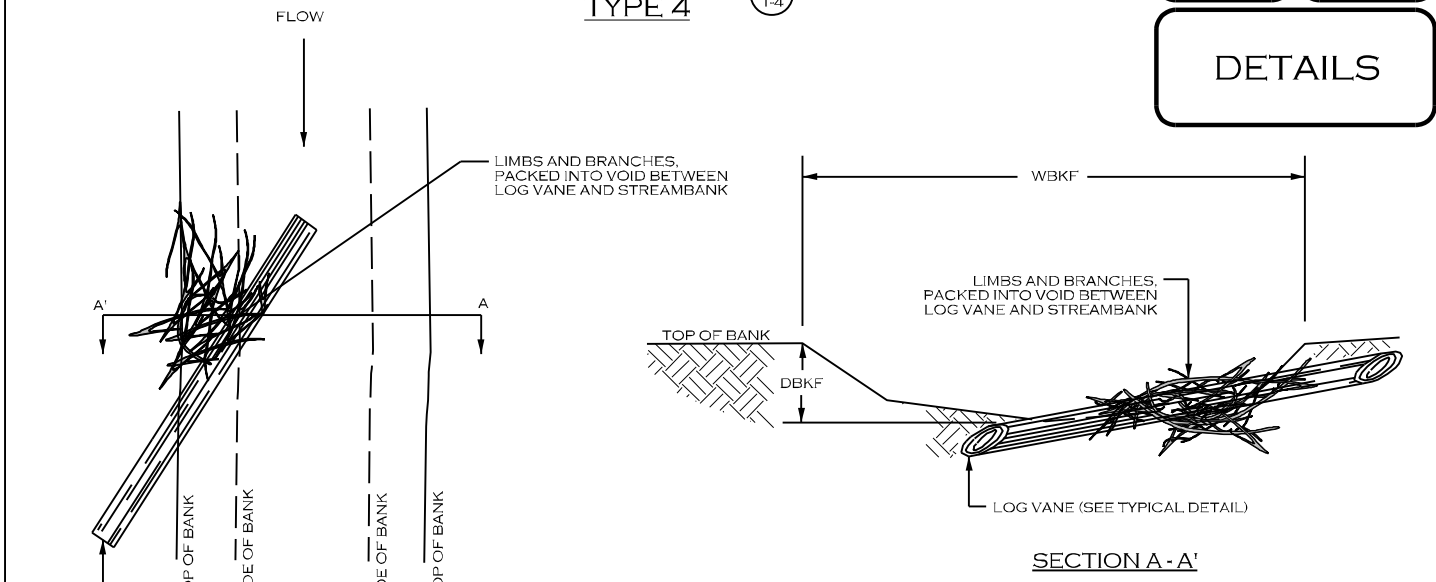
DEBRIS JAM TYPE 3 (DJ T-3)



DEBRIS JAM TYPE 3

1. DEBRIS JAM TYPE 3 INSTALLATIONS SHALL BE PLACED WITHIN STREAM RIFFLES OR POOLS TO TRAP DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH FLOWING WATER.
2. TREE SHALL BE ANY NON-EVERGREEN TREE WITH BRANCHES, AT LEAST 8 INCHES DIAMETER, AND NOT ROTTEN.
3. TREE SHALL HAVE CONSIDERABLE NUMBER OF BRANCHES THAT REMAIN EXPOSED AFTER INSTALLATION AND IN CONTACT WITH THE STREAM FLOW TO TRAP LEAVES AND DETRITUS FROM STREAM FLOW.
4. TREE SHALL BE INSTALLED SO THAT THE TRUNK IS IN CONTACT WITH THE STREAM BED, BACKFILL AND COMPACT AROUND THE TRUNK AND INSTALLED TREE TO MINIMIZE VOIDS.

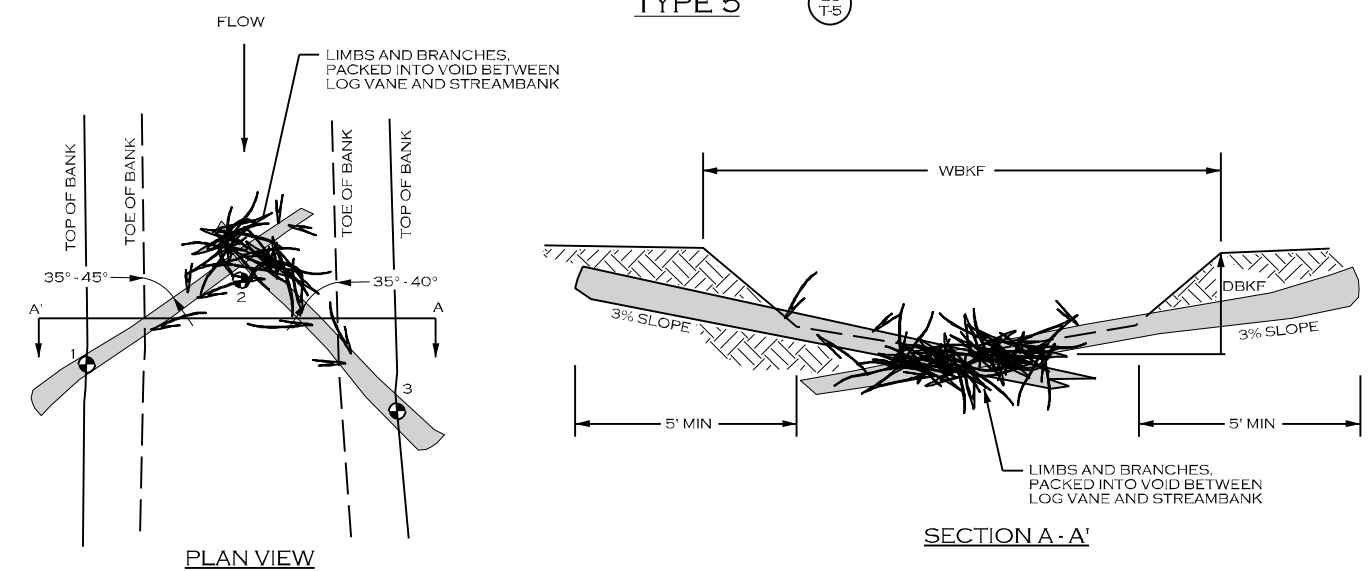
DEBRIS JAM TYPE 4 (DJ T-4)



DEBRIS JAM TYPE 4

1. DEBRIS JAM TYPE 4 INSTALLATIONS SHALL BE INSTALLED IN ASSOCIATION WITH LOG VANE INSTALLATIONS (SEE TYPICAL DETAIL FOR LOG VANE).
2. LIMBS AND BRANCHES THAT FORM THE DEBRIS JAM SHALL VARY IN DIAMETER, BUT SHALL BE AT LEAST 3 FEET LONG WITH MULTIPLE BRANCHES TO PROMOTE ENTANGLING WHEN PACKED TOGETHER. LIMBS AND BRANCHES SHOULD BE A MIXTURE (APPROX. 50/50) OF RECENTLY CUT BRANCHES AND DEAD/DECAYING BRANCHES.
3. PREPARE THE EXCAVATION FOR THE LOG VANE, THEN PLACE THE DEBRIS JAM PRIOR TO PLACING AND INSTALLING THE LOG VANE.
4. WHEN INSTALLED, THE LOG VANE SHOULD PIN THE DEBRIS JAM TO THE STREAM BED AND BANK AND PREVENT EASY MOVEMENT DURING HIGH FLOW EVENTS.
5. AFTER INSTALLATION, STREAM FLOW SHOULD BE IN CONTACT WITH THE DEBRIS JAM, IN ORDER TO TRAP ADDITIONAL DEBRIS AND ORGANIC MATTER.

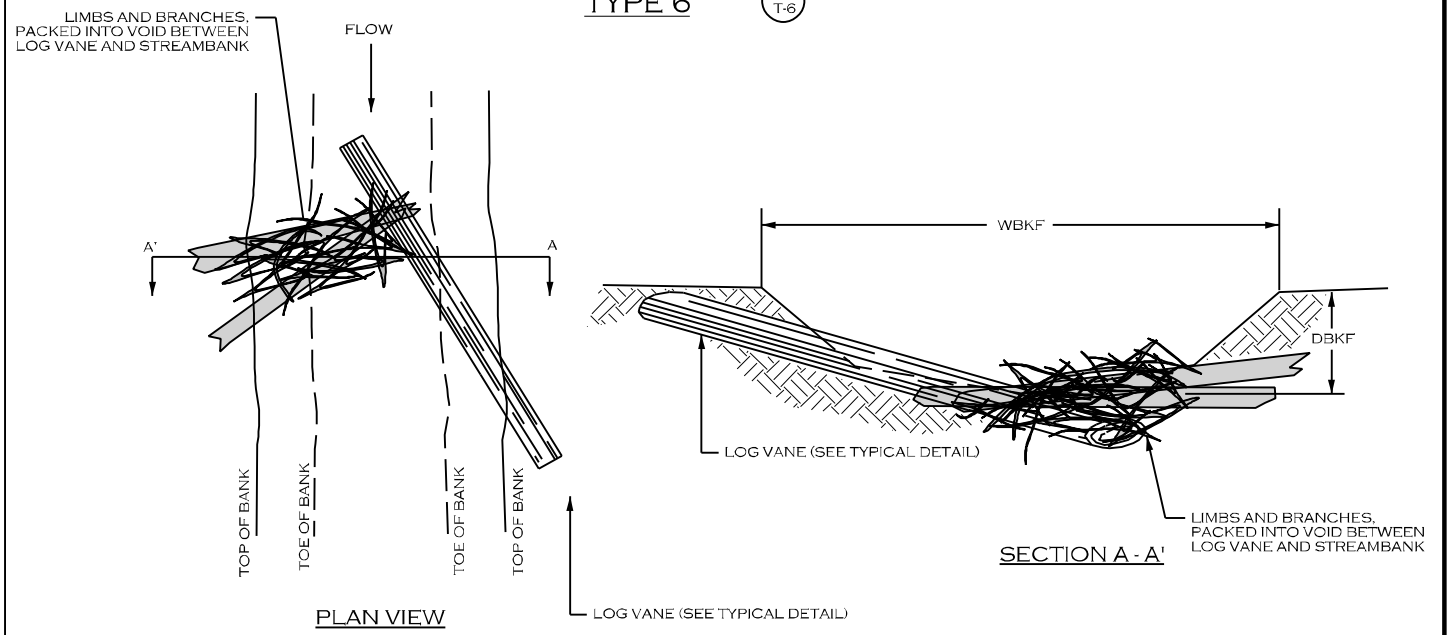
DEBRIS JAM TYPE 5 (DJ T-5)



DEBRIS JAM TYPE 5

1. DEBRIS JAM TYPE 5 INSTALLATIONS SHALL BE PLACED WITHIN STREAM RIFFLES TO TRAP DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH FLOWING, AERATED WATER.
2. LIMBS AND BRANCHES THAT FORM THE DEBRIS JAM SHALL VARY IN DIAMETER, BUT SHALL BE AT LEAST 3 FEET LONG WITH MULTIPLE BRANCHES TO PROMOTE ENTANGLING WHEN PACKED TOGETHER. LIMBS AND BRANCHES SHOULD BE A MIXTURE (APPROX. 50/50) OF RECENTLY CUT BRANCHES AND DEAD/DECAYING BRANCHES.
3. THE INVERT/CENTER OF THE STRUCTURE SHALL BE INSTALLED AT THE STREAM BED ELEVATION, SUCH THAT WATER IS NOT POOLED IN FRONT OF THE STRUCTURE.
4. PREPARE THE EXCAVATION FOR THE TWO LARGER LOGS, THEN PLACE THE DEBRIS JAM PRIOR TO PLACING AND INSTALLING THE TWO LARGER LOGS.
5. WHEN INSTALLED, THE LARGER LOGS SHOULD PIN THE DEBRIS JAM TO THE STREAM BED AND PREVENT EASY MOVEMENT DURING HIGH FLOW EVENTS. SMALL BOULDERS CAN BE USED TO PIN THE LARGER LOGS IN POSITION TO PREVENT MOVEMENT DURING STORM FLOWS.
6. AFTER INSTALLATION, STREAM FLOW SHOULD BE IN CONTACT WITH THE DEBRIS JAM, IN ORDER TO TRAP ADDITIONAL DEBRIS AND ORGANIC MATTER.

DEBRIS JAM TYPE 6 (DJ T-6)



DEBRIS JAM TYPE 6

1. DEBRIS JAM TYPE 6 INSTALLATIONS SHALL BE PLACED IN ASSOCIATION WITH LOG VANES TO TRAP DETRITUS AND ORGANIC MATTER AND KEEP IT IN CONTACT WITH FLOWING, AERATED WATER.
2. LIMBS AND BRANCHES THAT FORM THE DEBRIS JAM SHALL VARY IN DIAMETER, BUT SHALL BE AT LEAST 3 FEET LONG WITH MULTIPLE BRANCHES TO PROMOTE ENTANGLING WHEN PACKED TOGETHER. SMALL LOGS INCORPORATED INTO THE DEBRIS JAM SHALL BE LONG ENOUGH TO BE PINNED INTO PLACE BY THE LOG VANE AND BURIED INTO THE ADJACENT BANK. LIMBS, BRANCHES, AND SMALL LOGS SHOULD BE A MIXTURE (APPROX. 50/50) OF RECENTLY CUT BRANCHES AND DEAD/DECAYING BRANCHES.
3. THE INVERT/CENTER OF THE STRUCTURE SHALL BE INSTALLED AT THE STREAM BED ELEVATION, SUCH THAT WATER IS NOT POOLED IN FRONT OF THE STRUCTURE. AFTER COMPLETION, MOST STREAM FLOW SHOULD FLOW OVER THE LOG VANE AND BE CENTERED NEAR THE MIDDLE OF THE CHANNEL.

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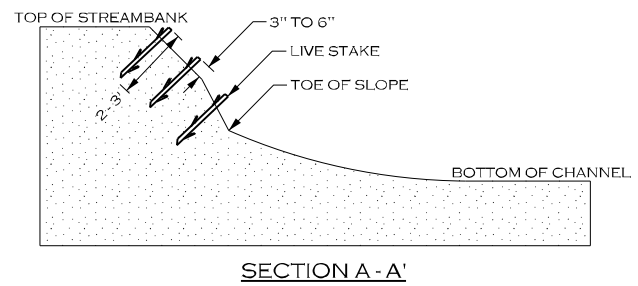
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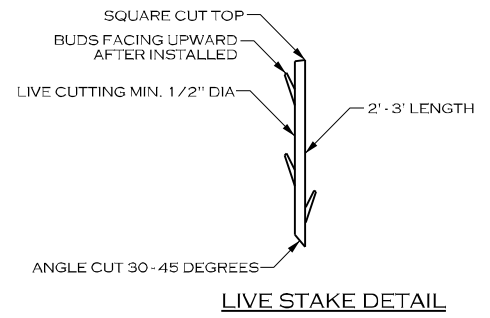
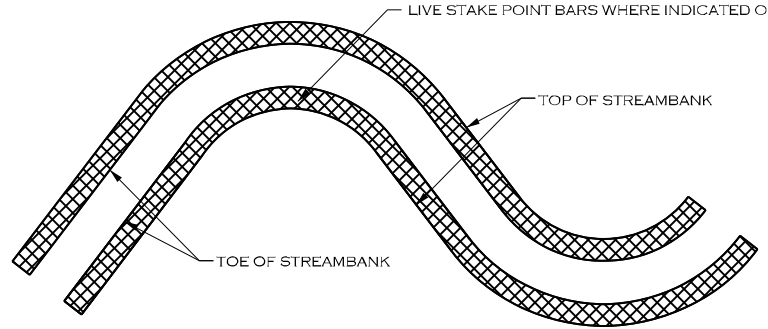
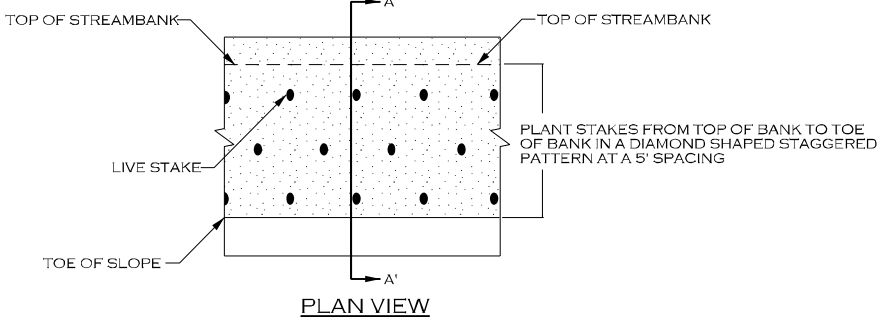
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DETAILS



LIVE STAKING



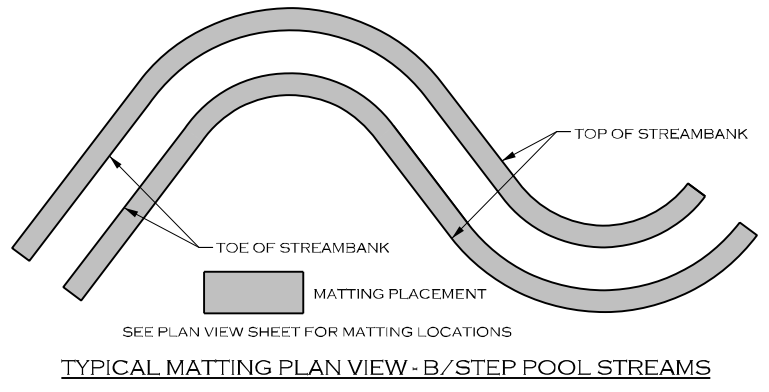
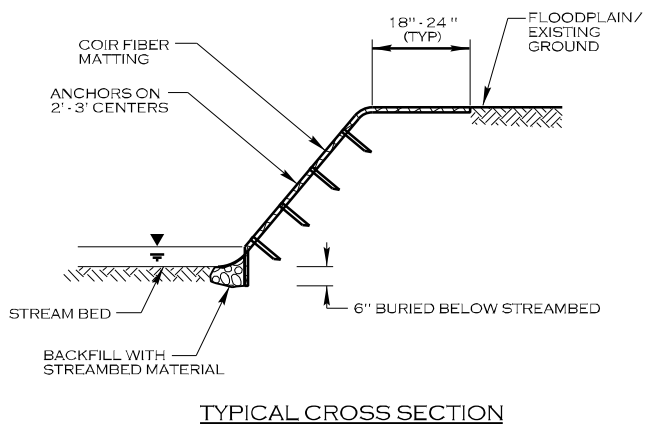
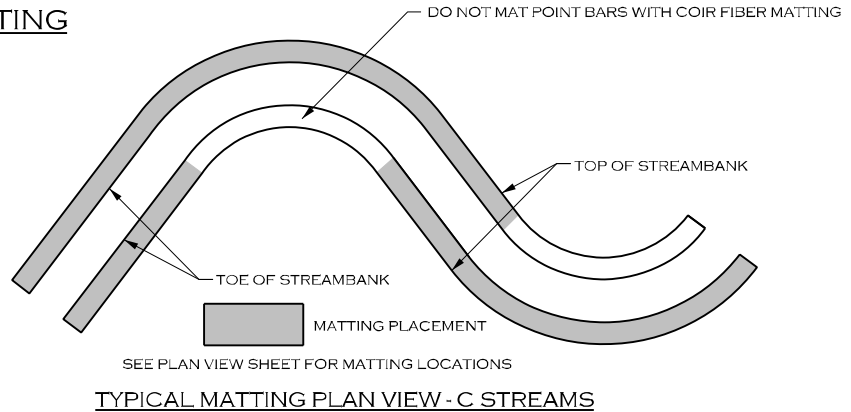
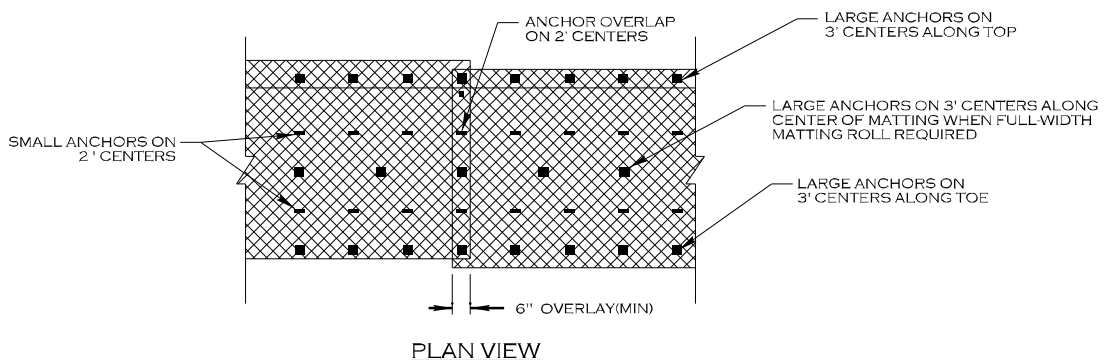
NOTES:

1. IF STAKES ARE BEING HARVESTED NEAR THE SITE, STAKES SHOULD BE CUT AND INSTALLED ON THE SAME DAY.
2. KEEP STAKES COOL AND MOIST WHILE ON THE JOB SITE AND PRIOR TO INSTALLATION.
3. DO NOT INSTALL STAKES THAT HAVE BEEN SPLIT.
4. STAKES MUST BE INSTALLED WITH BUDS POINTING UPWARDS.
5. STAKES SHALL BE INSTALLED PERPENDICULAR TO BANK.
6. STAKES SHALL BE 1/2 TO 2 INCHES IN DIAMETER AND 2 TO 3 FT LONG.
7. STAKES SHALL BE INSTALLED LEAVING 1/5 OF STAKE ABOVE GROUND.

SEE PLAN VIEW SHEET FOR LIVE STAKING LOCATIONS

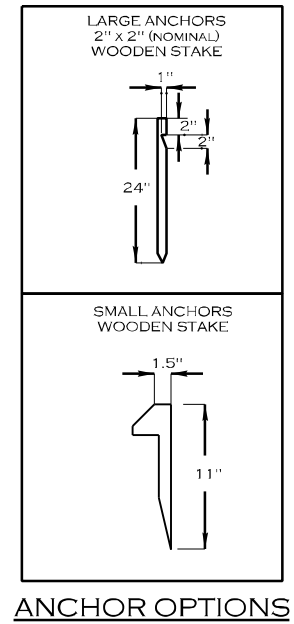
TYPICAL LIVE STAKING AREA PLAN VIEW

COIR FIBER MATTING



NOTES:

1. IN AREAS TO BE MATTED, ALL SEEDING, SOIL AMENDMENTS, AND SOIL PREPARATION MUST BE COMPLETED PRIOR TO PLACEMENT OF COIR FIBER MATTING.
2. WOODEN STAKES ARE PREFERRED. USE OF STAPLES AS SMALL ANCHORS MUST BE PRE-APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.



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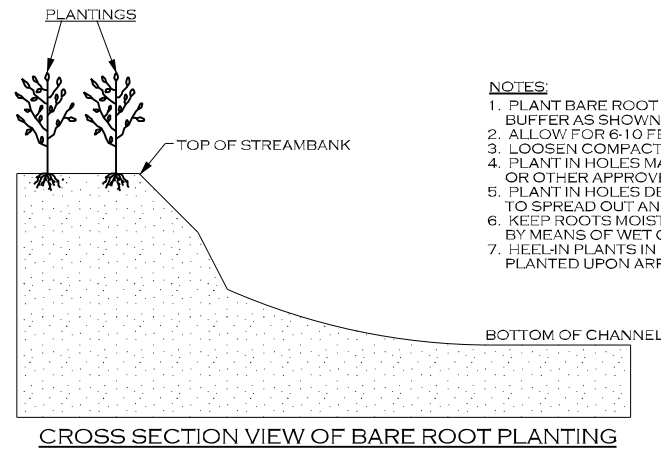
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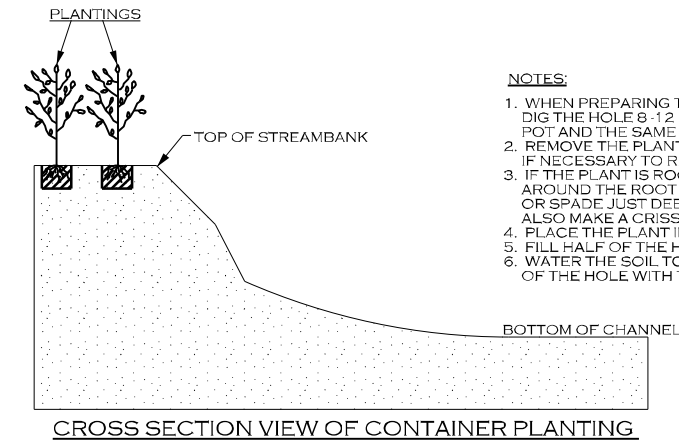
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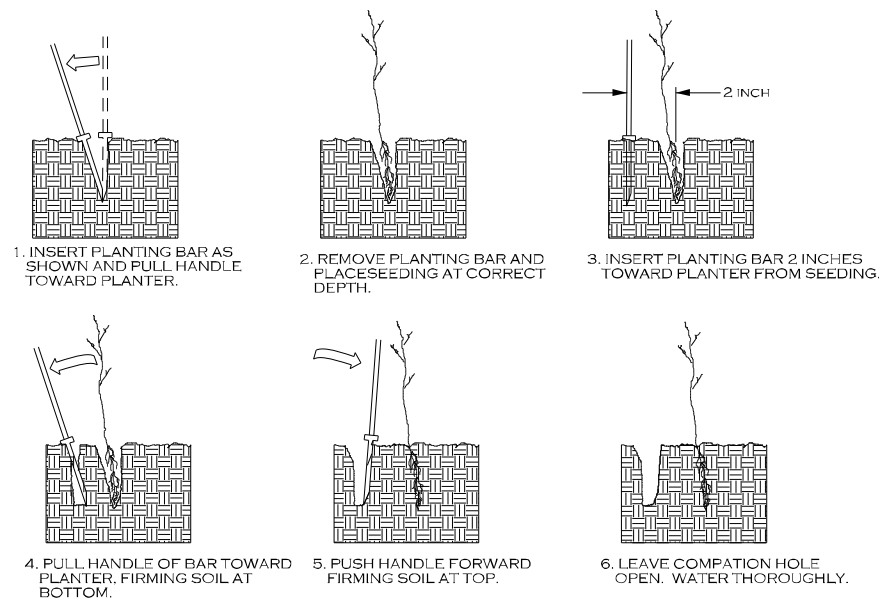
- NOTES:**
1. PLANT BARE ROOT SHRUBS AND TREES TO THE WIDTH OF THE BUFFER AS SHOWN ON THE PLANS.
  2. ALLOW FOR 6-10 FEET BETWEEN PLANTINGS, DEPENDING ON SIZE.
  3. LOOSEN COMPACTED SOIL.
  4. PLANT IN HOLES MADE BY A MATTOCK, DIBBLE, PLANTING BAR, OR OTHER APPROVED MEANS.
  5. PLANT IN HOLES DEEP AND WIDE ENOUGH TO ALLOW THE ROOTS TO SPREAD OUT AND DOWN WITHOUT J-ROOTING.
  6. KEEP ROOTS MOIST WHILE DISTRIBUTING OR WAITING TO PLANT BY MEANS OF WET CANVAS, BURLAP, OR STRAW.
  7. HEEL-IN PLANTS IN MOIST SOIL OR SAWDUST IF NOT PROMPTLY PLANTED UPON ARRIVAL TO PROJECT SITE.



- NOTES:**
1. WHEN PREPARING THE HOLE FOR A POTTED PLANT OR SHRUB DIG THE HOLE 8-12 INCHES LARGER THAN THE DIAMETER OF THE POT AND THE SAME DEPTH AS THE POT.
  2. REMOVE THE PLANT FROM THE POT. LAY THE PLANT ON ITS SIDE IF NECESSARY TO REMOVE THE POT.
  3. IF THE PLANT IS ROOTBOUND (ROOTS GROWING IN A SPIRAL AROUND THE ROOT BALL), MAKE VERTICAL CUTS WITH A KNIFE OR SPADE JUST DEEP ENOUGH TO CUT THE NET OF ROOTS. ALSO MAKE A CRISS-CROSS CUT ACROSS THE BOTTOM OF THE BALL.
  4. PLACE THE PLANT IN THE HOLE.
  5. FILL HALF OF THE HOLE WITH SOIL (SAME SOIL REMOVED FOR BACKFILL).
  6. WATER THE SOIL TO REMOVE AIR POCKETS AND FILL THE REST OF THE HOLE WITH THE REMAINING SOIL.

**Permitted Plans**

**DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR**



**PLANTING NOTES:**

**PLANTING BAG**

DURING PLANTING, SEEDLINGS SHALL BE KEPT IN A MOIST CANVAS BAG OR SIMILAR CONTAINER TO PREVENT THE ROOT SYSTEMS FROM DRYING.

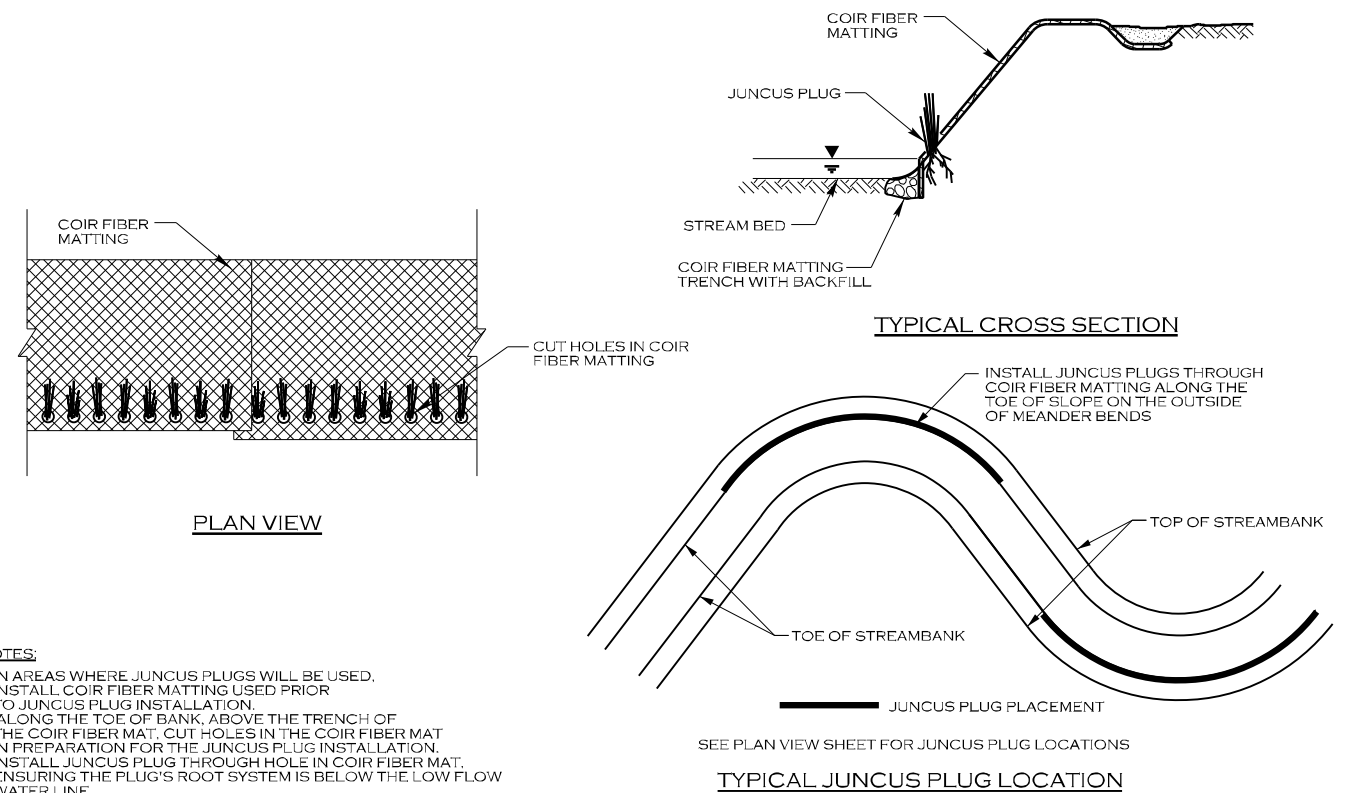
**KBC PLANTING BAR**

PLANTING BAR SHALL HAVE A BLADE WITH A TRIANGULAR CROSS SECTION, AND SHALL BE 12 INCHES LONG, 4 INCHES WIDE AND 1 INCH THICK AT CENTER.

**ROOT PRUNING**

ALL SEEDLINGS SHALL BE ROOT PRUNED, IF NECESSARY, SO THAT NO ROOTS EXTEND MORE THAN 10 INCHES BELOW THE ROOT COLLAR.

**JUNCUS PLUG**



**NOTES:**

1. IN AREAS WHERE JUNCUS PLUGS WILL BE USED, INSTALL COIR FIBER MATTING USED PRIOR TO JUNCUS PLUG INSTALLATION.
2. ALONG THE TOE OF BANK, ABOVE THE TRENCH OF THE COIR FIBER MAT, CUT HOLES IN THE COIR FIBER MAT IN PREPARATION FOR THE JUNCUS PLUG INSTALLATION.
3. INSTALL JUNCUS PLUG THROUGH HOLE IN COIR FIBER MAT, ENSURING THE PLUG'S ROOT SYSTEM IS BELOW THE LOW FLOW WATER LINE.

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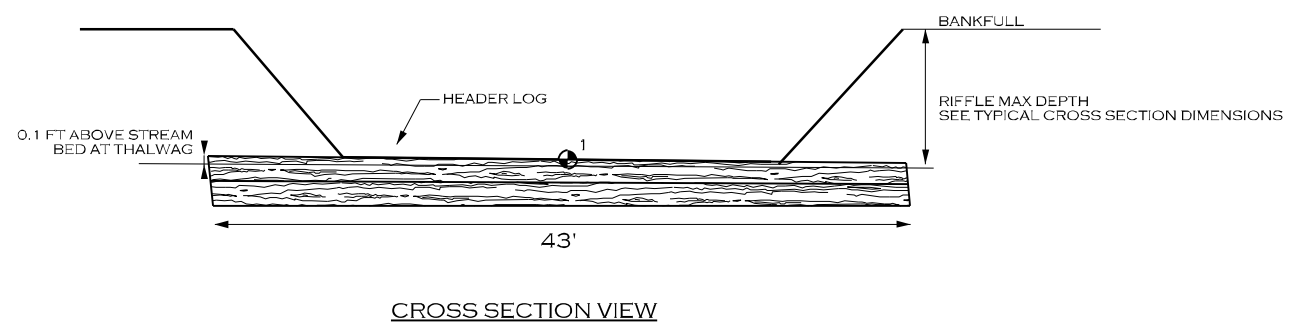
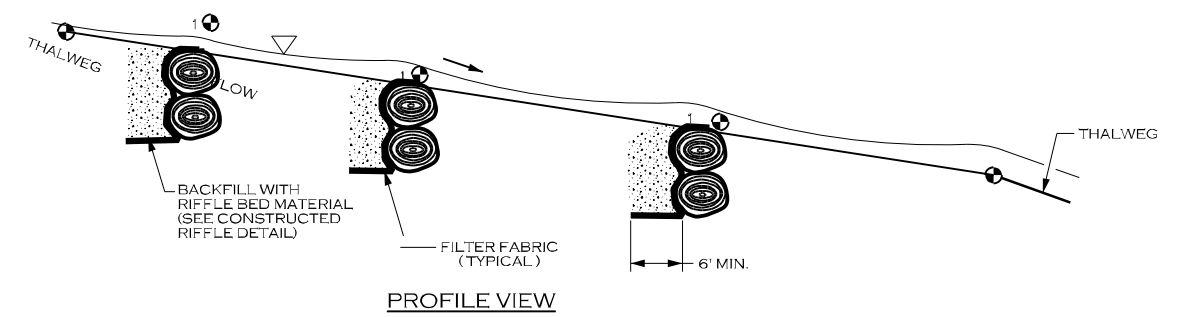
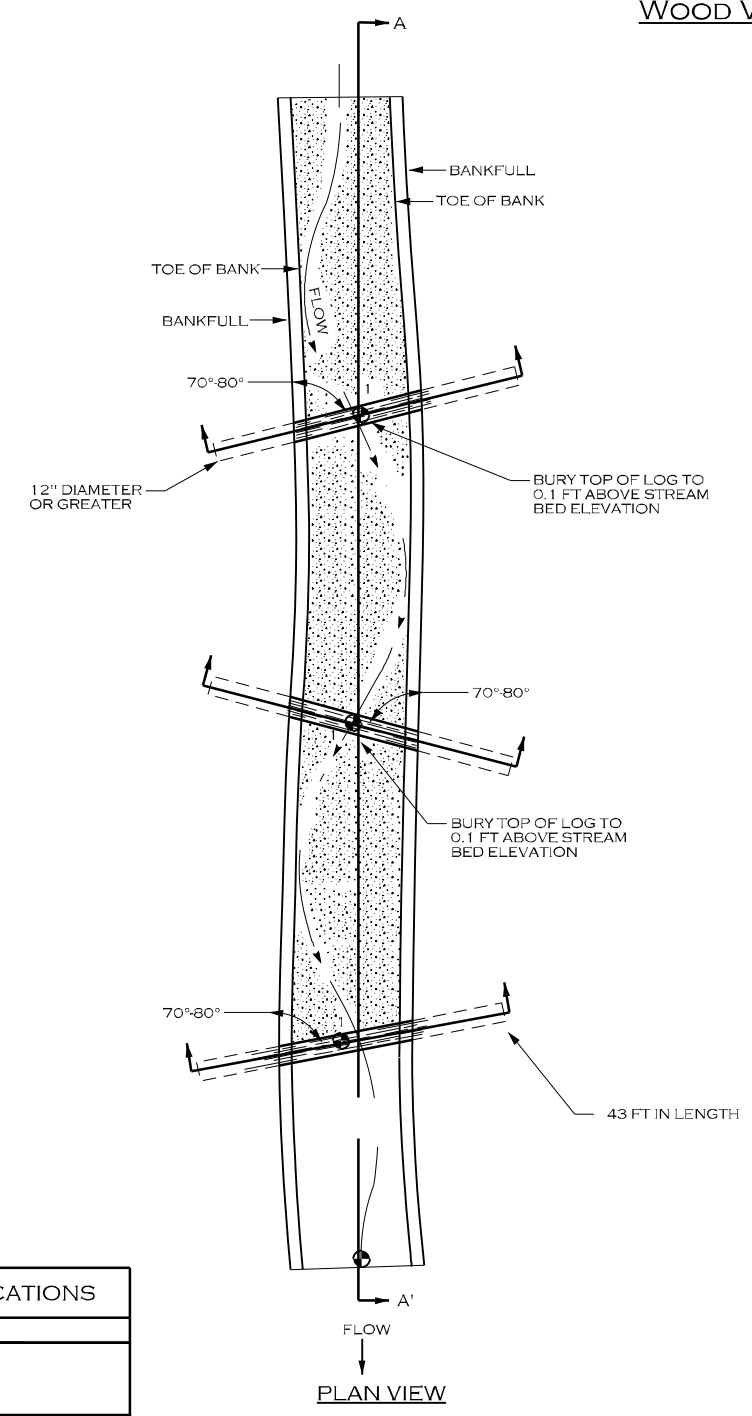
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WOOD VALLEY GRADE CONTROL SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
RIFFLE BED MATERIAL	SEE CONSTRUCTED RIFFLE DETAIL
LOGS	TYPE: HARDWOOD SIZE: LENGTH = 43 FEET, 12" DIA. NUMBER OF HEADER LOGS: 1 NUMBER OF FOOTER LOGS: 1
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
<b>NOTES FOR LOG ROLLER STRUCTURES:</b>	
1. STRUCTURE DIMENSIONS AND MEASUREMENTS ARE SHOWN ON THE STRUCTURE TABLES SHEET. NUMBER OF LOGS MAY VARY.	
2. LOGS SHOULD BE STRAIGHT, HARDWOOD, AND NOT ROTTEN.	
3. SOIL SHOULD BE COMPACTED WELL AROUND BURIED PORTIONS OF LOGS.	
4. FILTER FABRIC SHOULD BE NAILED TO THE LOG BELOW THE STONE BACKFILL.	
5. RIFFLE STATIONS AND ELEVATIONS (1 & 5) ARE SHOWN ON BOTH THE STRUCTURE TABLES FOR WOOD VALLEY GRADE CONTROL AND CONSTRUCTED RIFFLES IF APPLICABLE.	
6. NUMBER OF LOGS MAY VARY.	

● ELEVATION POINT (SEE STRUCTURE TABLES)

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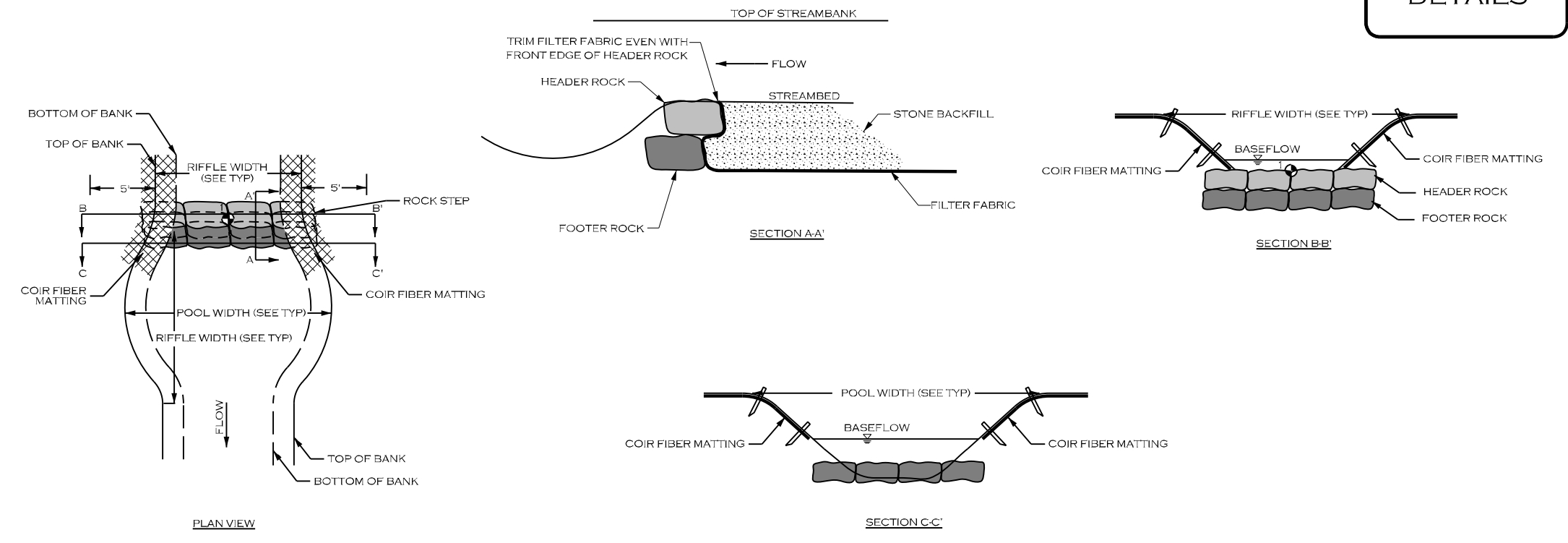


DETAILS

ROCK STEP (RS)

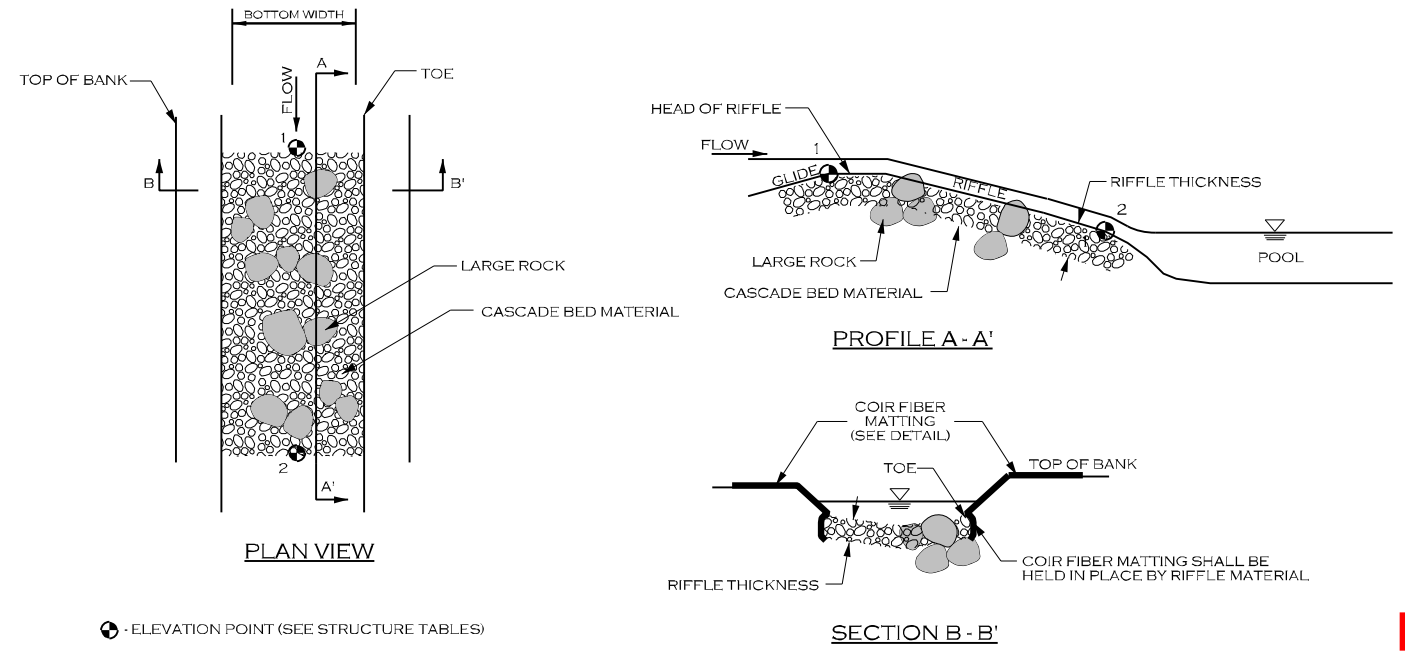
• ELEVATION POINT (SEE STRUCTURE TABLE)

ROCK STEP SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
BOULDER	TYPE: GRANITE OR COMPARABLE SIZE: 3 FT X 2 FT X 2 FT
FILTER FABRIC	TYPE: TYPE 2 NON-WOVEN WIDTH UPSTREAM: 6 FT MINIMUM
COIR FIBER MATTING	TYPE: SEE DETAIL
<b>NOTES FOR ROCK STEP STRUCTURES:</b>	
<ol style="list-style-type: none"> <li>DIG A TRENCH BELOW THE STREAM BED FOR FOOTER AND HEADER ROCKS, FILTER FABRIC AND STONE BACKFILL.</li> <li>PLACE FOOTER ROCKS AND THEN HEADER ROCKS TO ACHIEVE DESIGN DIMENSIONS AND ELEVATIONS.</li> <li>USE HAND PLACED STONE TO FILL GAPS AND VOIDS ON UPSTREAM SIDE OF THE HEADER AND FOOTER ROCKS.</li> <li>PLACE FILTER FABRIC BEGINNING AT THE TOP OF THE HEADER ROCKS AND EXTENDING DOWN TO THE DEPTH OF THE FOOTER ROCKS, THEN OUTWARD THE DISTANCE SPECIFIED IN THE STRUCTURES TABLE SHEET.</li> <li>INSTALL STONE BACKFILL, AS SHOWN, TO THE DIMENSIONS INDICATED IN THE STRUCTURES TABLE SHEET.</li> <li>AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ONSITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.</li> <li>PLACE TRANSPLANTS FROM TOE OF STREAMBANK TO TOP OF STREAMBANK.</li> <li>TRANSPLANTS CAN BE SUBSTITUTED WITH COIR FIBER MATTING AT THE DIRECTION OF THE ENGINEER.</li> </ol>	



CONSTRUCTED CASCADE (CC)

CONSTRUCTED CASCADE SPECIFICATIONS	
MATERIALS:	SPECIFICATIONS:
LARGE ROCKS	TYPE: GRANITE OR COMPARABLE SIZE: 2 X 1 X 1 FT THICKNESS: 24 INCHES MIN.
CASCADE BED MATERIAL	TYPE: GRANITE OR COMPARABLE SIZE: CLASS A AND CLASS B (50/50 MIX) THICKNESS: 16 INCHES MIN.
COIR FIBER MATTING	SEE DETAIL
<b>NOTES FOR CONSTRUCTED CASCADE STRUCTURES:</b>	
<ol style="list-style-type: none"> <li>GRADE STREAMBED AND BANKS TO PROPOSED DIMENSIONS PER TYPICAL CROSS-SECTION AND PROFILE.</li> <li>EXCAVATE TRENCH BELOW PROPOSED STREAMBED ELEVATION EQUAL TO OR GREATER THAN RIFFLE THICKNESS.</li> <li>PLACE COIR FIBER MATTING ON BANKS AND LAY DOWN INTO TRENCH EXCAVATED FOR RIFFLE BED MATERIAL.</li> <li>FILL TRENCH WITH STONE TO FINAL DESIGN STREAM GRADE.</li> </ol>	



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SUMTER NATIONAL FOREST  
ENROEE RANGER DISTRICT  
STREAM AND RIPARIAN RESTORATION/  
ENHANCEMENT PROJECT  
CLARKS CREEK WATERSHED  
CHESTER COUNTY, SOUTH CAROLINA

PREPARED IN THE OFFICE OF:

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LICENSE # 5371

PROJECT ENGINEER

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# VEGETATION SELECTION

## TABLES

### SOUTH-CENTRAL OAK-HARDWOOD & PINE FOREST

PIGNET HICKORY (*CARYA GLABRA*)  
 MOCKERNUT HICKORY (*CARYA TOMENTOSA*)  
 FLOWERING DOGWOOD (*CORNUS FLORIDA*)  
 EASTERN RED CEDAR (*JUNIPERUS VIRGINIANA*)  
 TULIP POPLAR (*LIRIODENDRON TULIPIFERA*)  
 BLACK GUM (*NYSSA SYLVATICA*)

SOURWOOD (*OXYDENDRUM ARBOREUM*)  
 SHORTLEAF PINE (*PINUS ECHINATA*)  
 SOUTHERN RED OAK (*QUERCUS FALCATA*)  
 NORTHERN RED OAK (*QUERCUS RUBRA*)  
 POST OAK (*QUERCUS STELLATA*)  
 BLACK OAK (*QUERCUS VELUTINA*)

### CENTRAL MESOPHYTIC HARDWOOD FOREST

SOUTHERN SUGAR MAPLE (*ACER BARBATUM*)  
 RED MAPLE (*ACER RUBRUM*)  
 SOUTHERN SHAGBARK HICKORY  
 (*CARYA CAROLINAE-SEPTRIONALIS*)  
 PIGNET HICKORY (*CARYA GLABRA*)  
 MOCKERNUT HICKORY (*CARYA TOMENTOSA*)  
 SUGARBERRY (*CELTIS LAEVIGATA*)  
 AMERICAN BEECH (*FAGUS GRANDIFOLIA*)  
 WHITE ASH (*FRAXINUS AMERICANA*)  
 BLACK WALNUT (*JUGLANS NIGRA*)  
 TULIP POPLAR (*LIRIODENDRON TULIPIFERA*)

CUCUMBER MAGNOLIA (*MAGNOLIA ACUMINATA*)  
 BLACK GUM (*NYSSA SYLVATICA*)  
 WHITE OAK (*QUERCUS ALBA*)  
 BLACK OAK (*QUERCUS NIGRA*)  
 NORTHERN RED OAK (*QUERCUS RUBRA*)  
 AMERICAN BASSWOOD (*TILIA AMERICANA*)  
 IRONWOOD (*CARPINUS CAROLINIANA*)  
 REDBUD (*CERCIS CANADENSIS*)  
 FLOWERING DOGWOOD (*CORNUS FLORIDA*)  
 HOP HORNBEAM (*OSTRYA VIRGINIANA*)  
 SOURWOOD (*OXYDENDRUM ARBOREUM*)

### SOUTHERN FLOODPLAIN HARDWOOD FOREST

SOUTHERN SUGAR MAPLE (*ACER BARBATUM*)  
 BOXELDER (*ACER NEGUNDO*)  
 RED MAPLE (*ACER RUBRUM*)  
 RIVER BIRCH (*BETULA NIGRA*)  
 SHAGBARK HICKORY (*CARYA OVATA*)  
 SUGARBERRY (*CELTIS LAEVIGATA*)  
 AMERICAN BEECH (*FAGUS GRANDIFOLIA*)  
 BLACK WALNUT (*JUGLANS NIGRA*)  
 TULIP POPLAR (*LIRIODENDRON TULIPIFERA*)  
 BLACK GUM (*NYSSA SYLVATICA*)  
 AMERICAN SYCAMORE (*PLATANUS OCCIDENTALIS*)  
 WHITE OAK (*QUERCUS ALBA*)  
 SWAMP CHESTNUT OAK (*QUERCUS MICHAUXII*)

WILLOW OAK (*QUERCUS PHELLOS*)  
 NORTHERN RED OAK (*QUERCUS RUBRA*)  
 AMERICAN BASSWOOD (*TILIA AMERICANA*)  
 AMERICAN ELM (*ULMUS AMERICANA*)  
 SWITCH CANE (*ARUNDINARIA TECTA*)  
 BEAUTYBERRY (*CALLICARPA AMERICANA*)  
 IRONWOOD (*CARPINUS CAROLINIANA*)  
 FLOWERING DOGWOOD (*CORNUS FLORIDA*)  
 POSSUMHAW (*ILEX DECIDUA*)  
 EASTERN RED CEDAR (*JUNIPERUS VIRGINIANA*)  
 SPICEBUSH (*LINDERA BENZOIN*)  
 SOURWOOD (*OXYDENDRUM ARBOREUM*)

### EASTERN NORTH AMERICA WET MEADOW AND MARSH

SILKY DOGWOOD (*CORNUS AMOMUM*)  
 BLACK WILLOW (*SALIX NIGRA*)

BUTTONBUSH (*CEPHALANTHUS OCCIDENTALIS*)

### NORTHERN & CENTRAL SWAMP FOREST (STREAMSIDE ASSEMBLAGE)

RED MAPLE (*ACER RUBRUM*)  
 BLACK GUM (*NYSSA SYLVATICA*)  
 WILLOW OAK (*QUERCUS PHELLOS*)  
 TAG ALDER (*ALNUS SERRULATA*)

IRONWOOD (*CARPINUS CAROLINIANA*)  
 SILKY DOGWOOD (*CORNUS AMOMUM*)  
 POSSUMHAW (*ILEX DECIDUA*)  
 ELDERBERRY (*SAMBUCUS CANADENSIS*)

### NOTES:

1. SPECIES LISTED ARE PRELIMINARY AND MAY BE MODIFIED BASED ON AVAILABILITY AT THE TIME OF PLANTING.
2. SPECIES TO BE PLANTED WILL BE CLOSELY COORDINATED WITH THE US FOREST SERVICE STAFF AT SUMTER NATIONAL FOREST, ENOREE RANGE DISTRICT.
3. CLEARING AND REMOVAL OF EXISTING TREES AND VEGETATION WILL BE LIMITED TO THE EXTENT PRACTICABLE.
4. ALL DISTURBED AREAS WILL BE REPLANTED WITH APPROPRIATE HERBACEOUS AND WOODY SPECIES, BASED ON LANDSCAPE POSITION, MOISTURE REGIME, LANDFORM, AND SOILS.
5. THE NORTHERN AND CENTRAL SWAMP FOREST (STREAMSIDE ASSEMBLAGE) CORRESPONDS TO VEGETATED WETLANDS IN SEEPAGES AND SMALL STREAM HEADWATERS.
6. THE SOUTHERN FLOODPLAIN HARDWOOD FOREST IS THE PRIMARY TARGET COMMUNITY FOR FLOODPLAIN AREAS.
7. THE EASTERN NORTH AMERICAN WET MEADOW AND MARSH AREAS CORRESPOND TO LOW LYING AND DEPRESSIONAL (FLOODPLAIN POOL) AREAS.
8. THE CENTRAL MESOPHYTIC HARDWOOD FOREST SPECIES WILL BE PLANTED ALONG TERRACE AND VALLEY SIDE SLOPES.
9. THE SOUTH-CENTRAL OAK-HARDWOOD AND PINE FOREST WILL BE REPLANTED ON ADJACENT UPLAND AND ACCESS AREAS WITHIN THE LIMITS OF DISTURBANCE.

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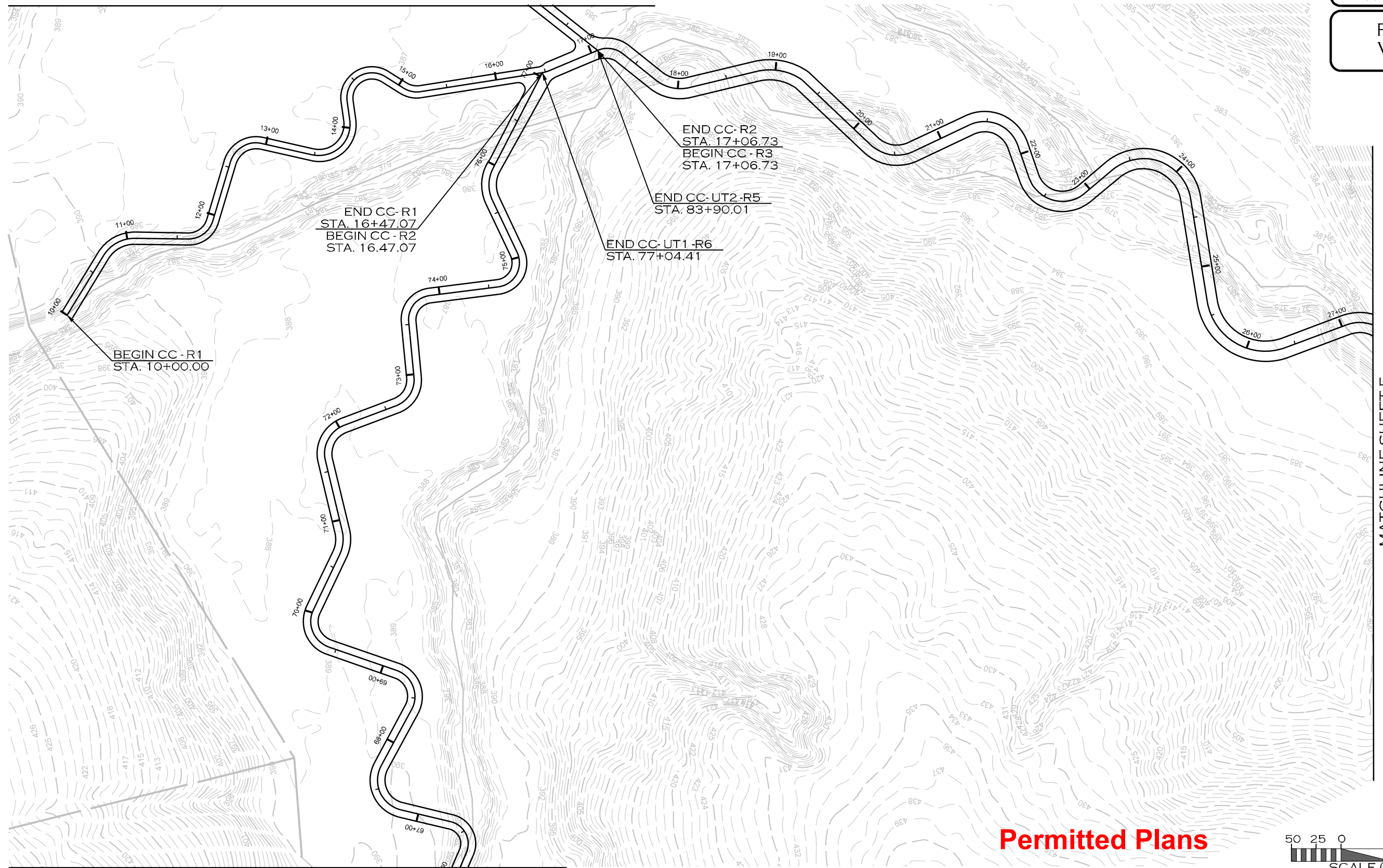
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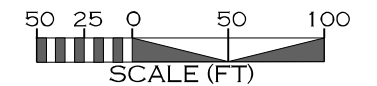


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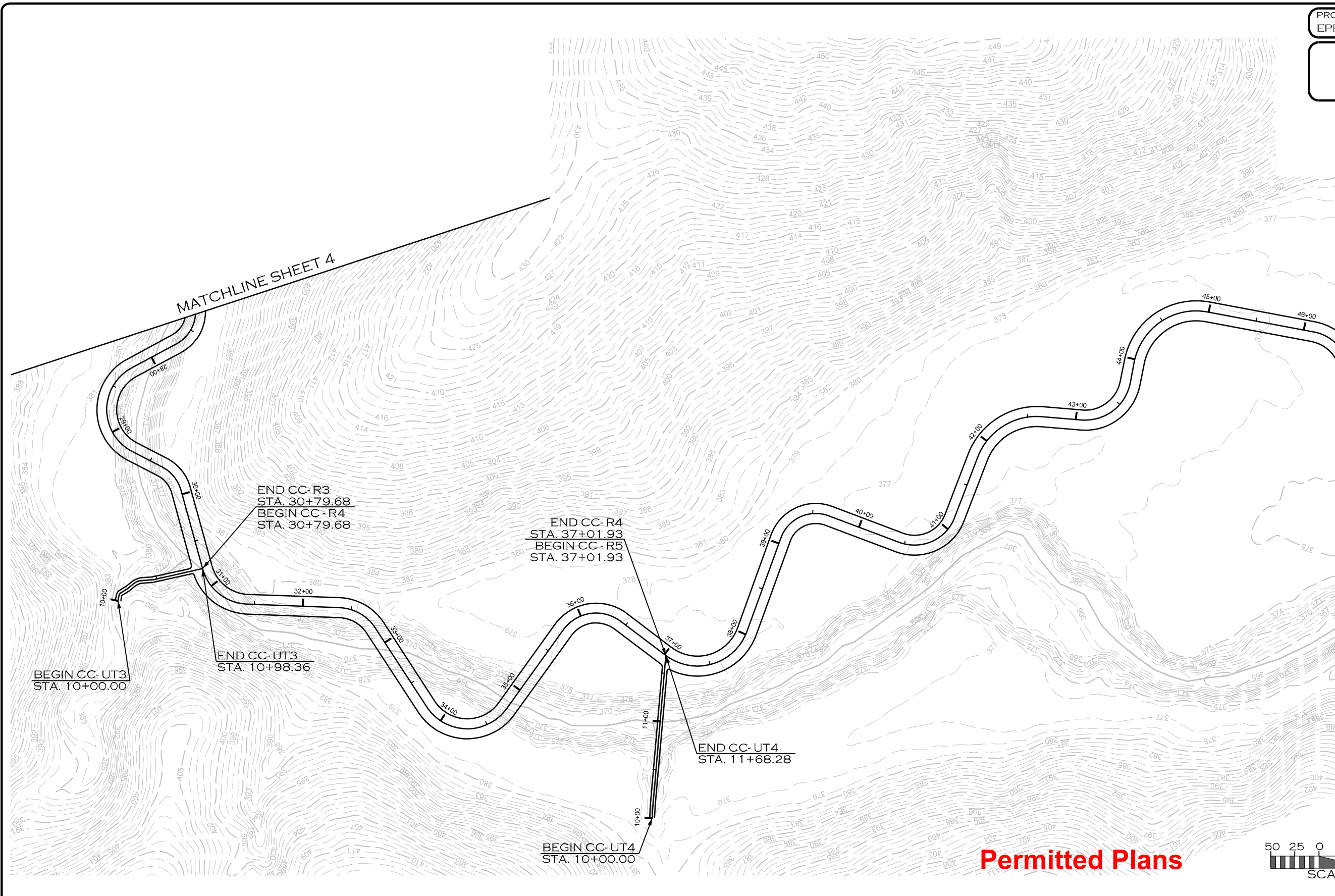
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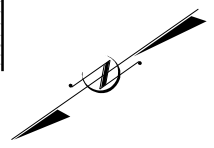
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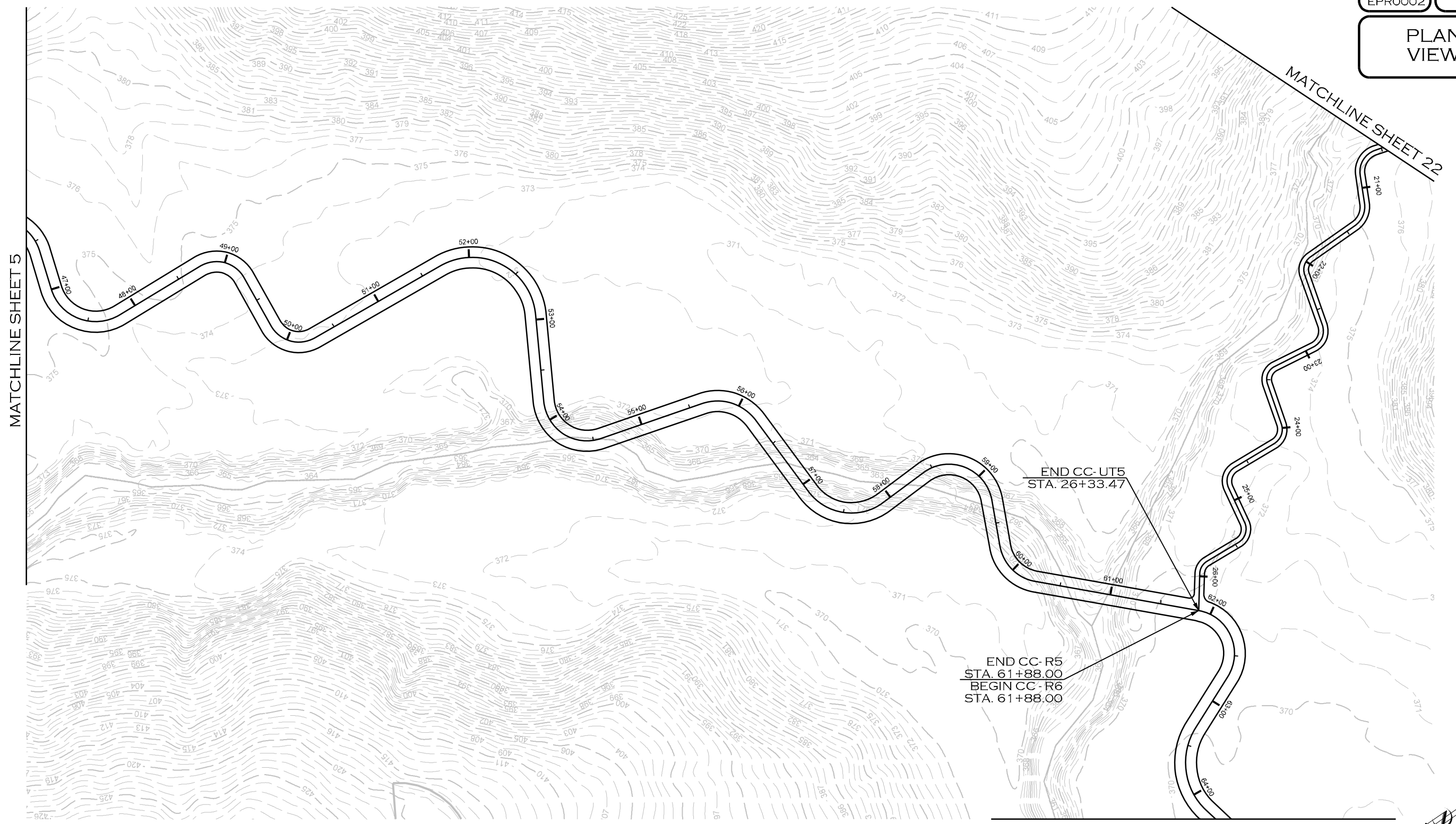
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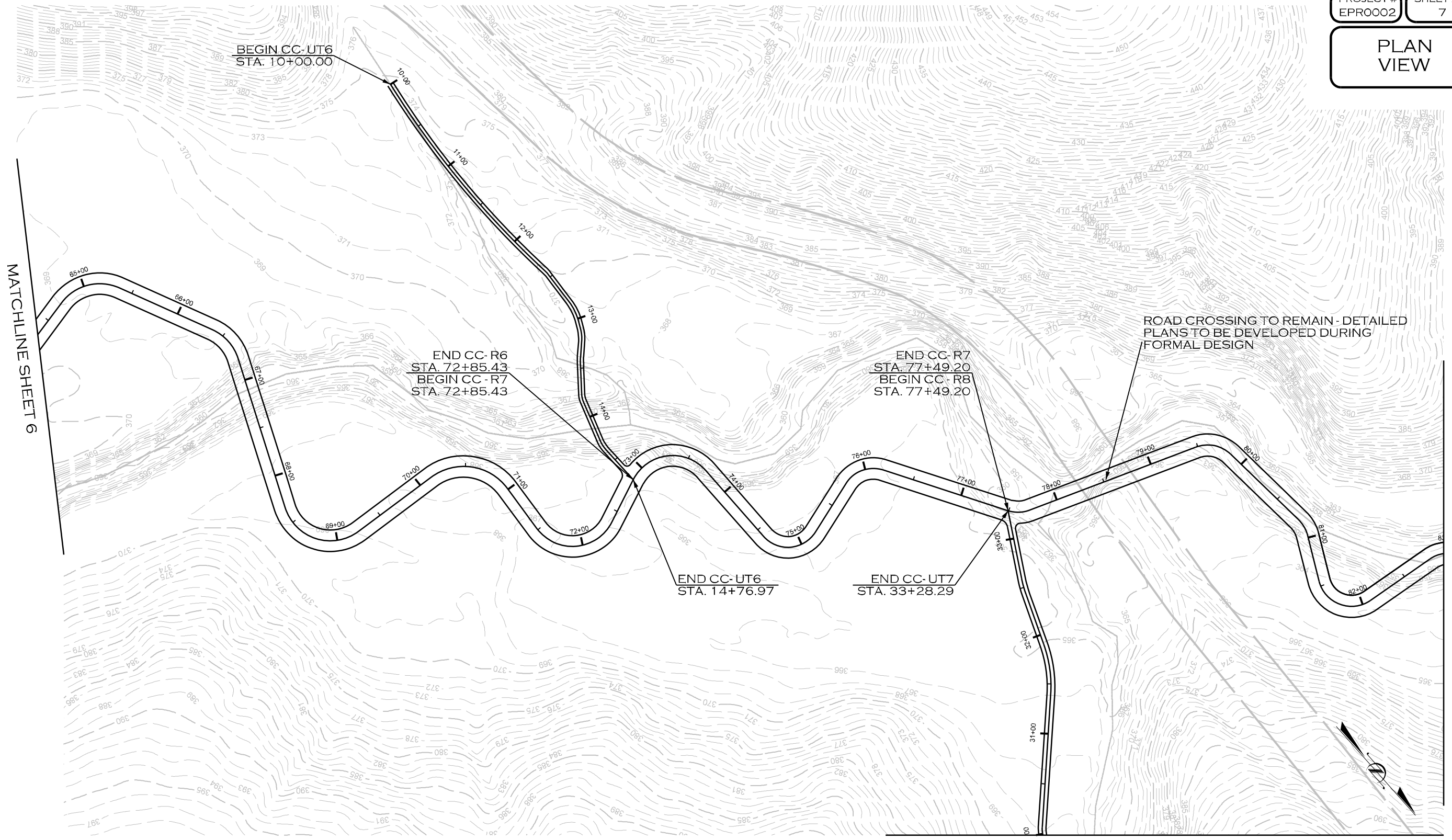
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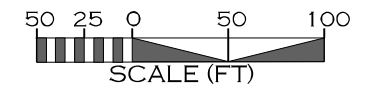


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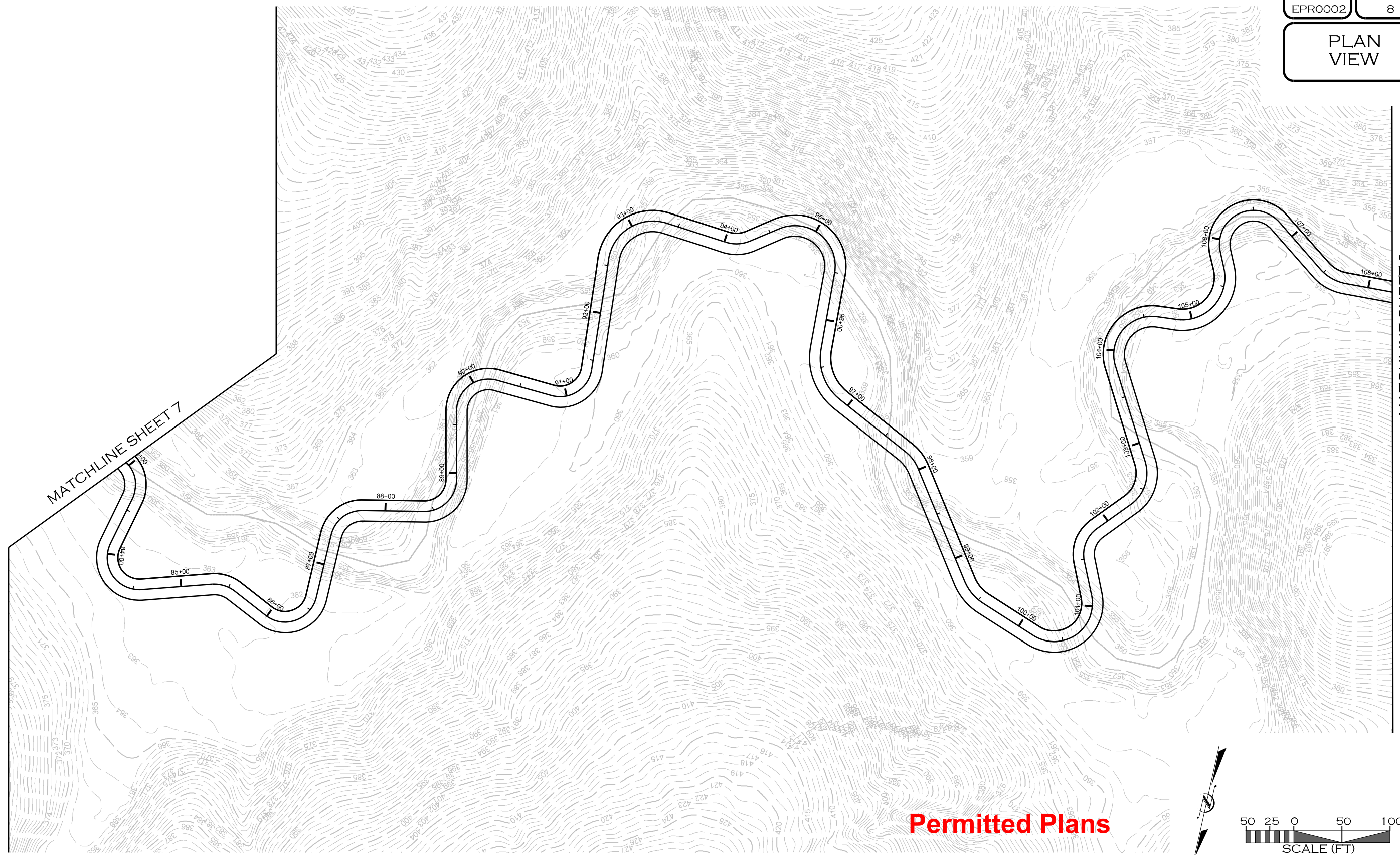
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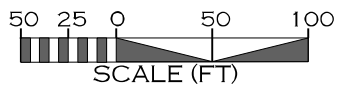
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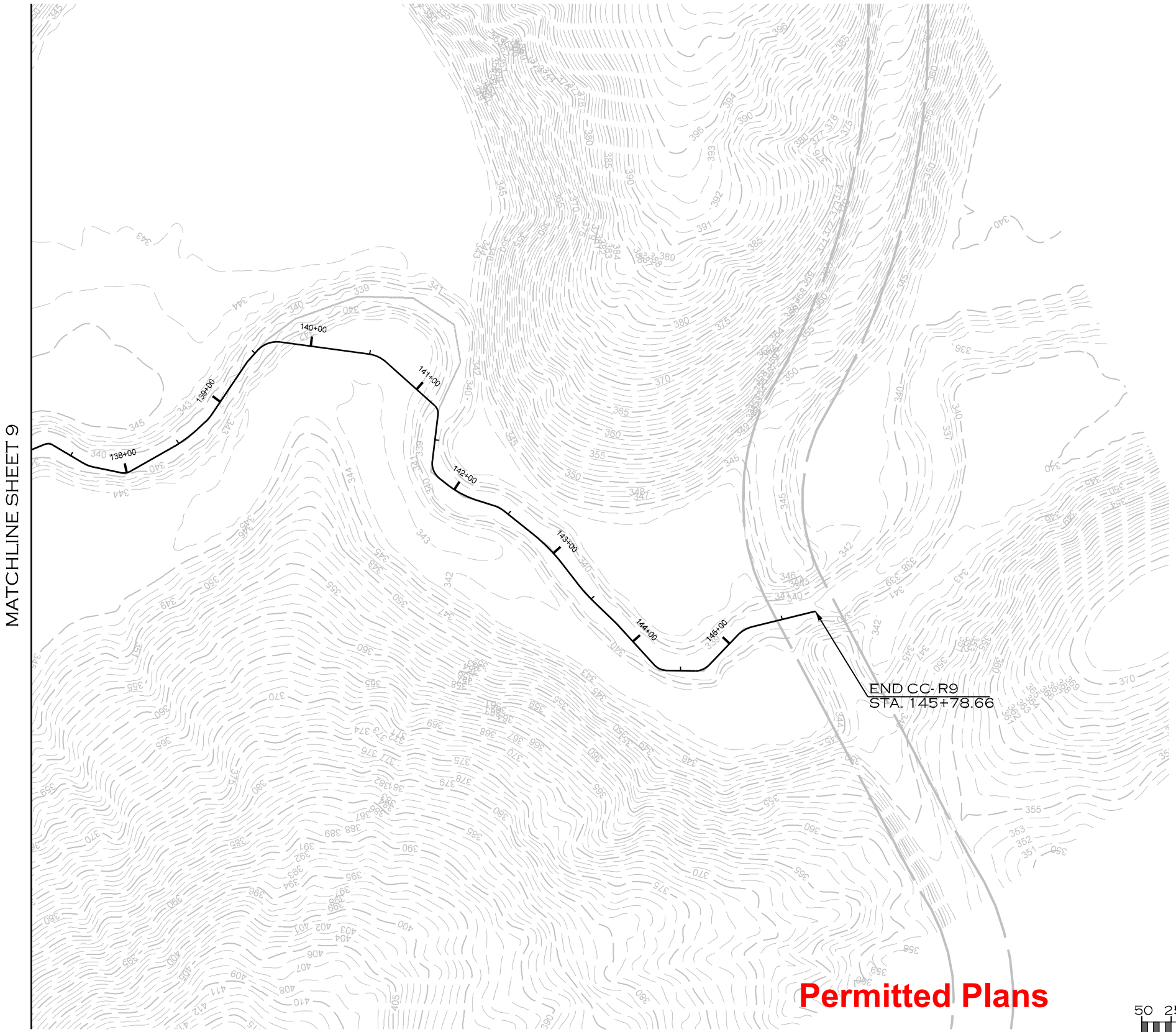
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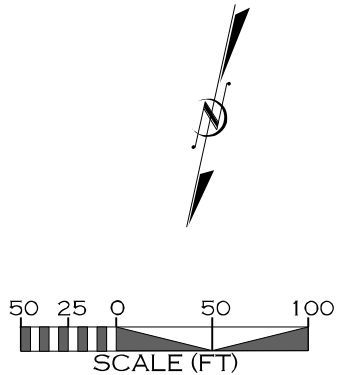
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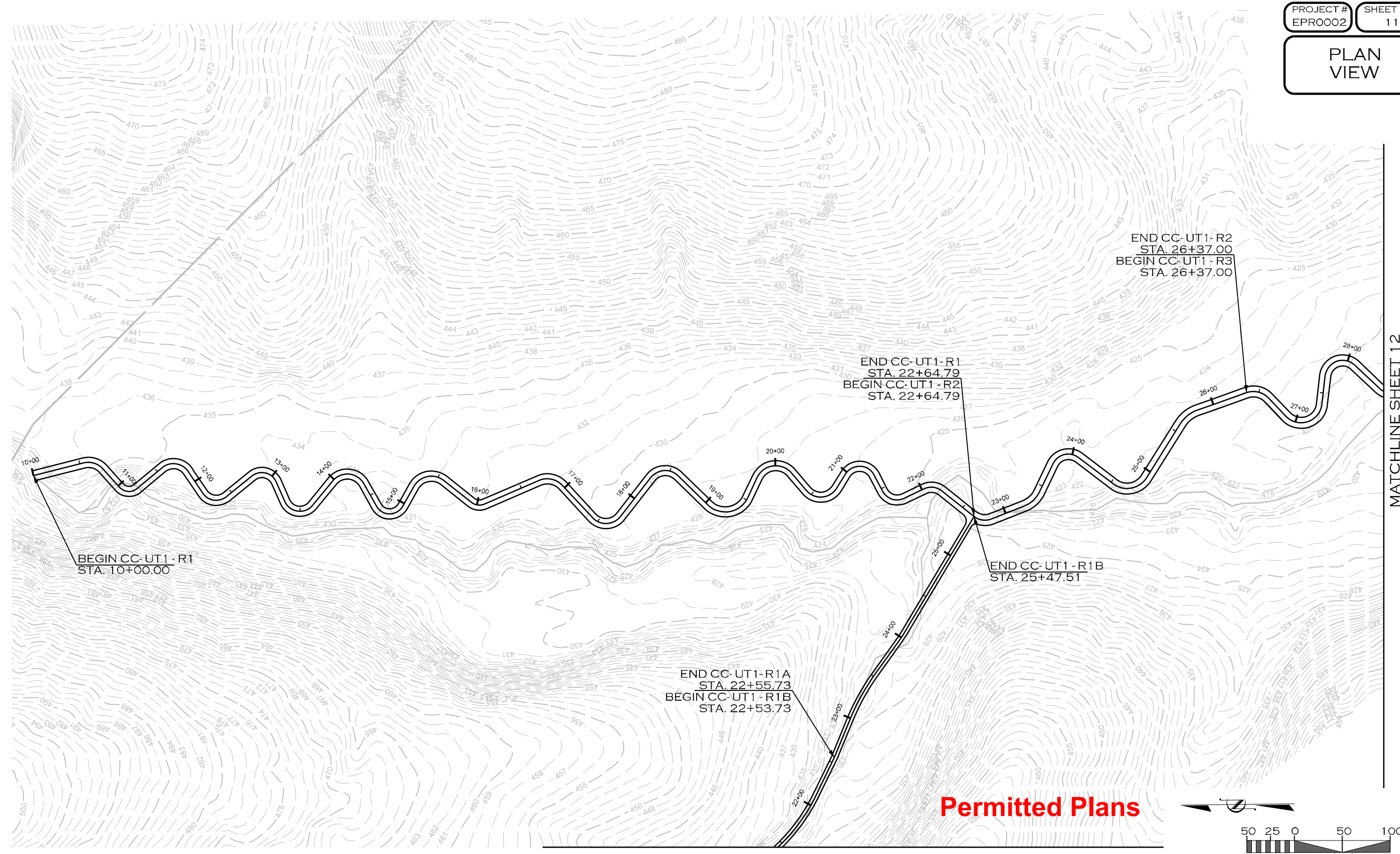
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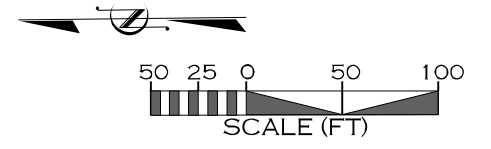
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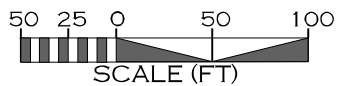
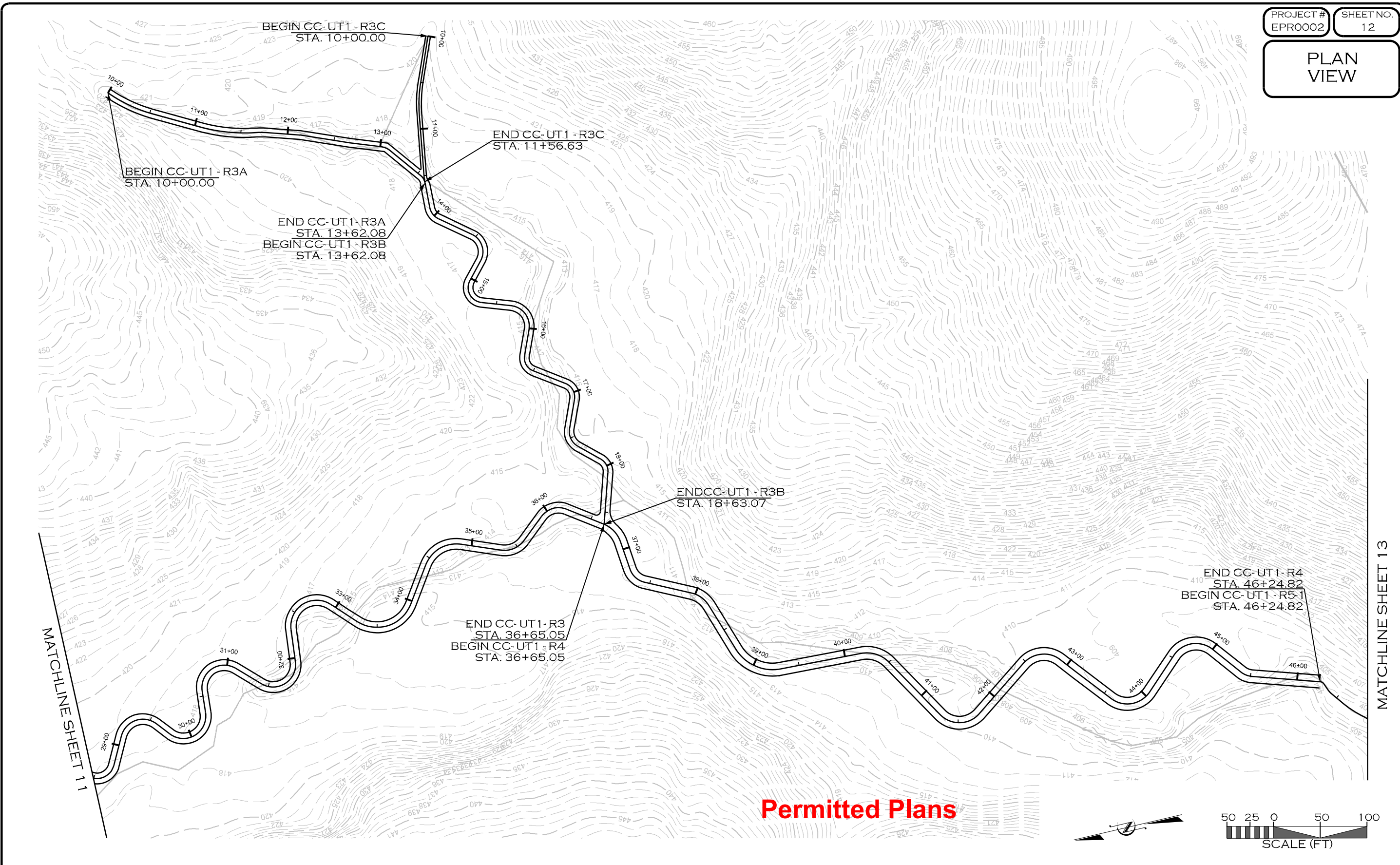
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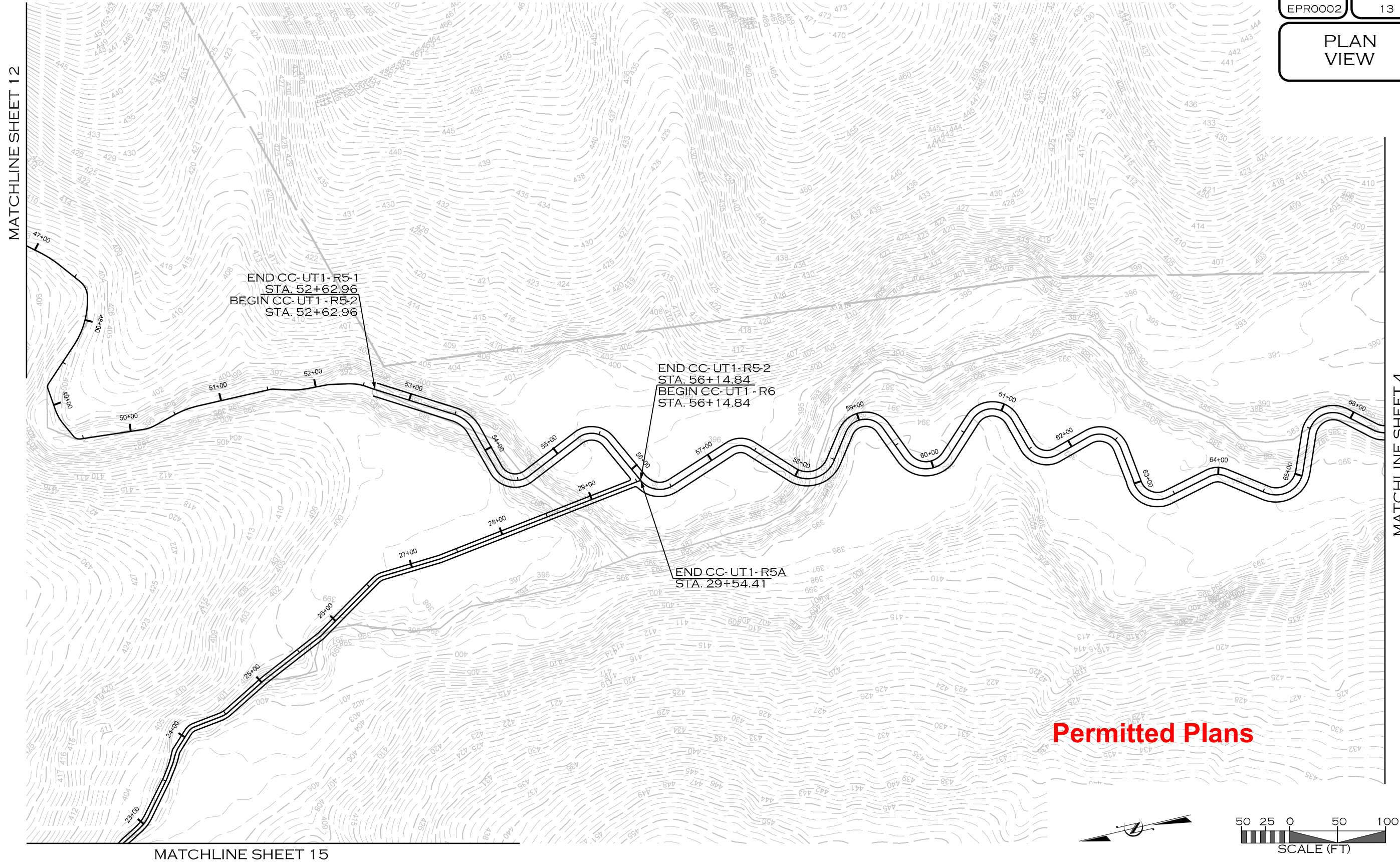
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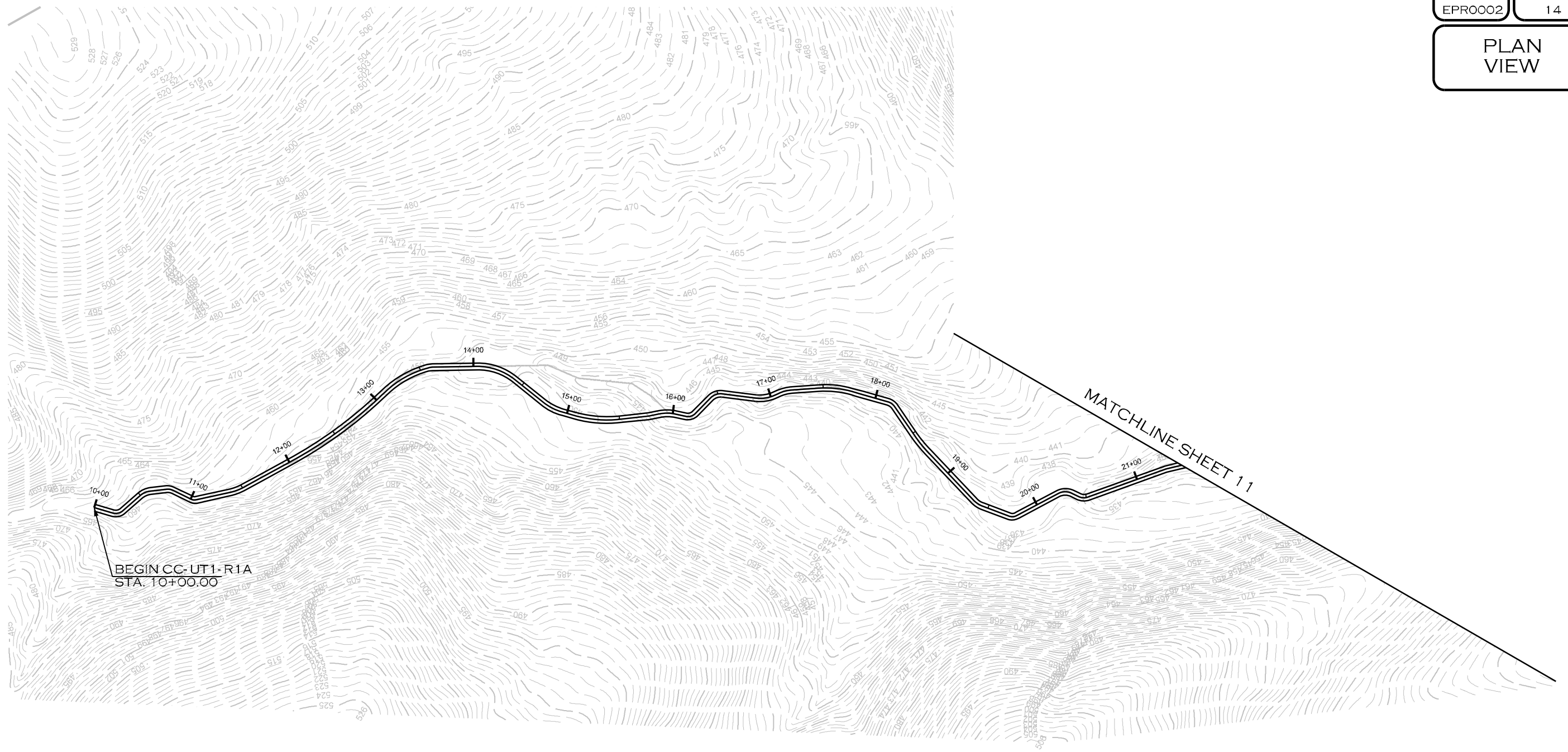


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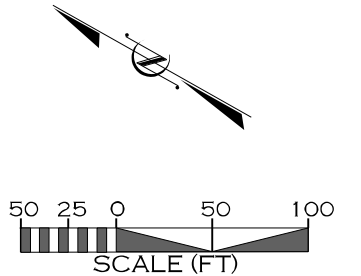
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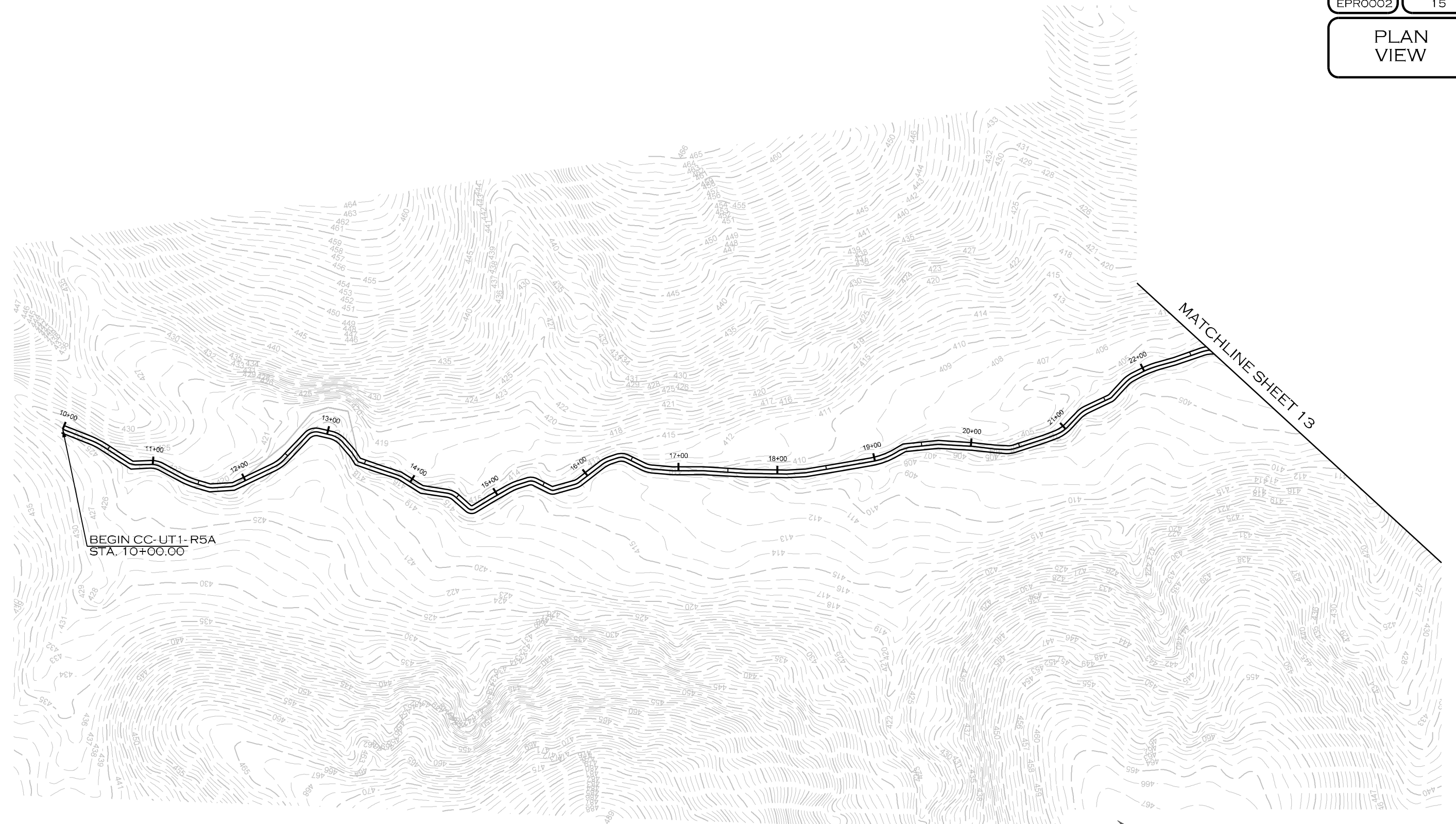
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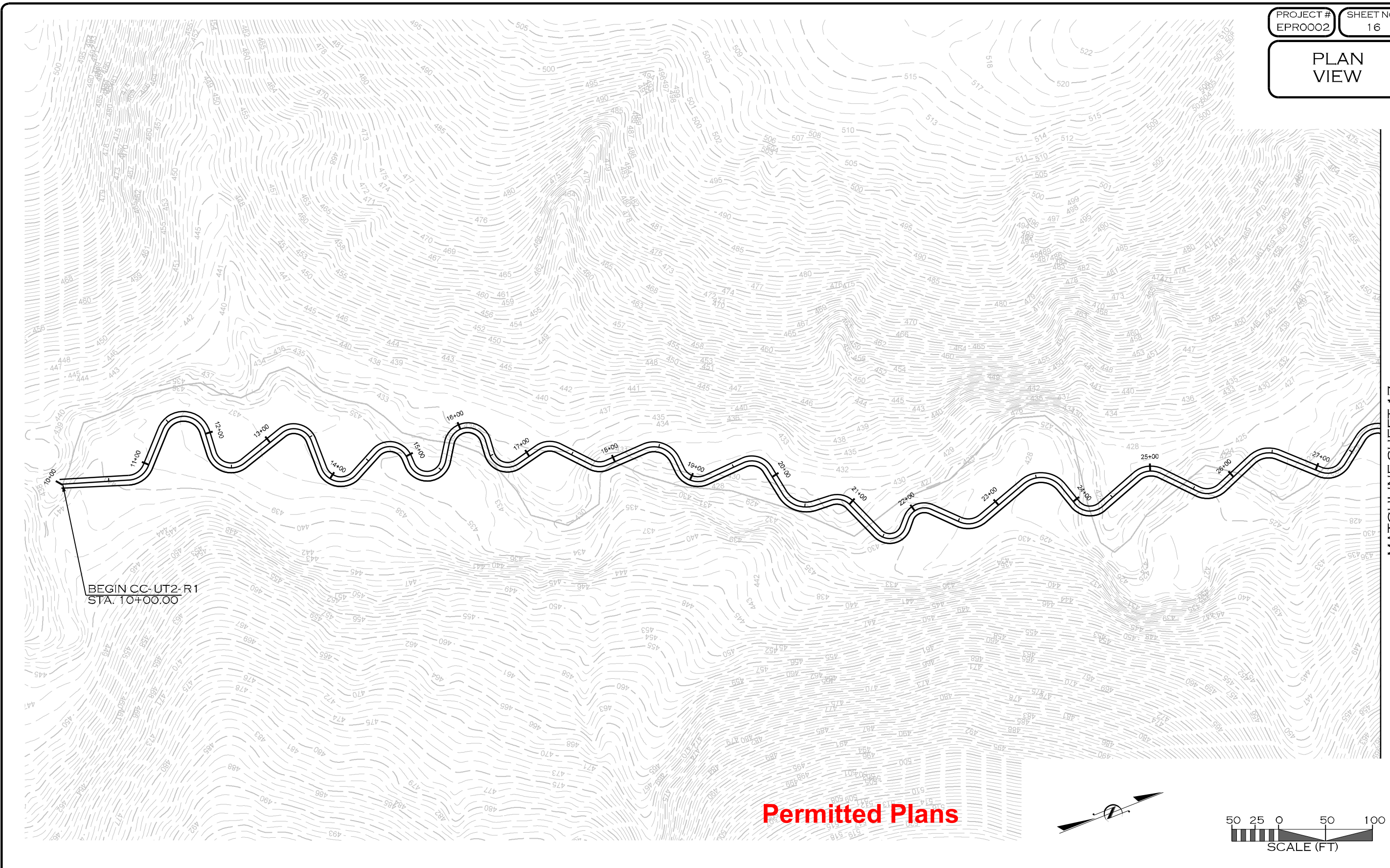
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STA. 10+00.00

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REVISIONS				
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1	PERMITTING DESIGN PLANS	EB	KLT	10/25/23

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FOR SCOUT MOTORS

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ENROEE RANGER DISTRICT  
STREAM AND RIPARIAN RESTORATION/  
ENHANCEMENT PROJECT  
CLARKS CREEK WATERSHED  
CHESTER COUNTY, SOUTH CAROLINA

PREPARED IN THE OFFICE OF:

1150 SE MAYNARD RD, SUITE 140  
CARY, NC 27511  
LICENSE # 5371

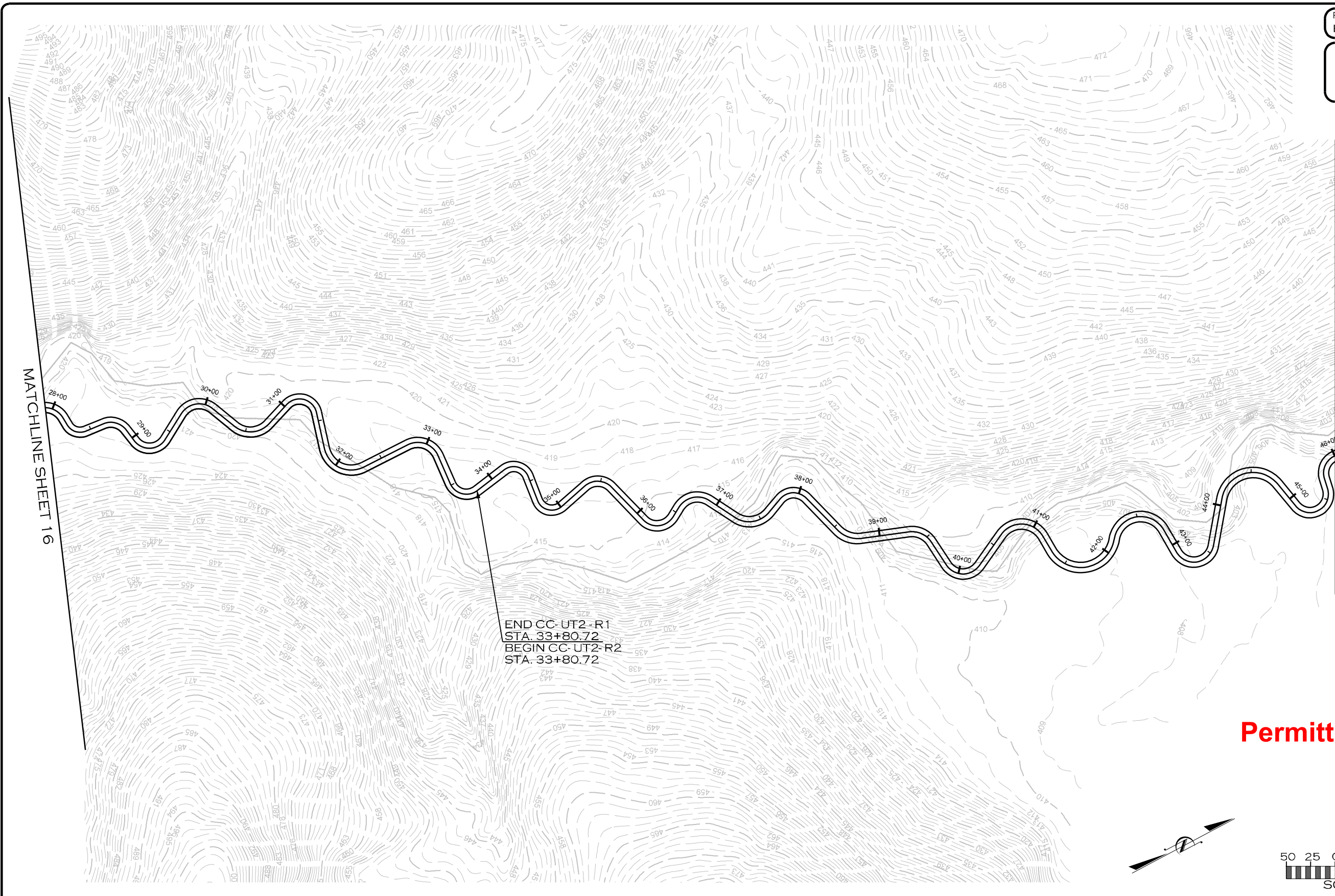
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MATCHLINE SHEET 17



PLAN  
VIEW

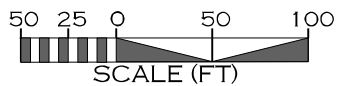
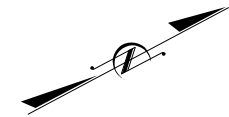


MATCHLINE SHEET 16

MATCHLINE SHEET 18

END CC-UT2-R1  
STA. 33+80.72  
BEGIN CC-UT2-R2  
STA. 33+80.72


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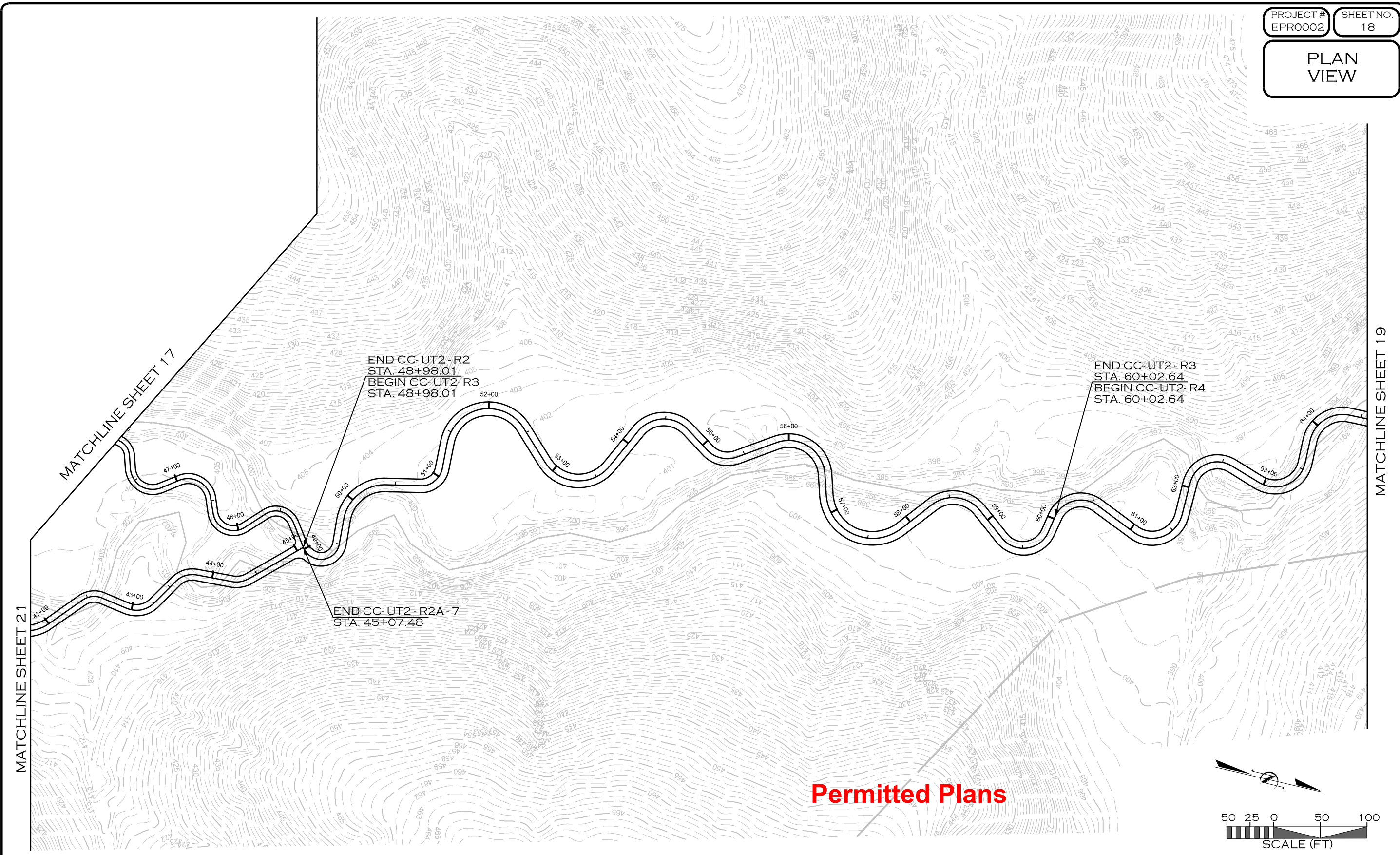


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MORON

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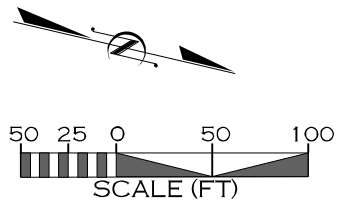
MATCHLINE SHEET 18



END CC-UT2-R4  
STA. 66+32.98  
BEGIN CC-UT2-R5  
STA. 66+32.98

MATCHLINE SHEET 4


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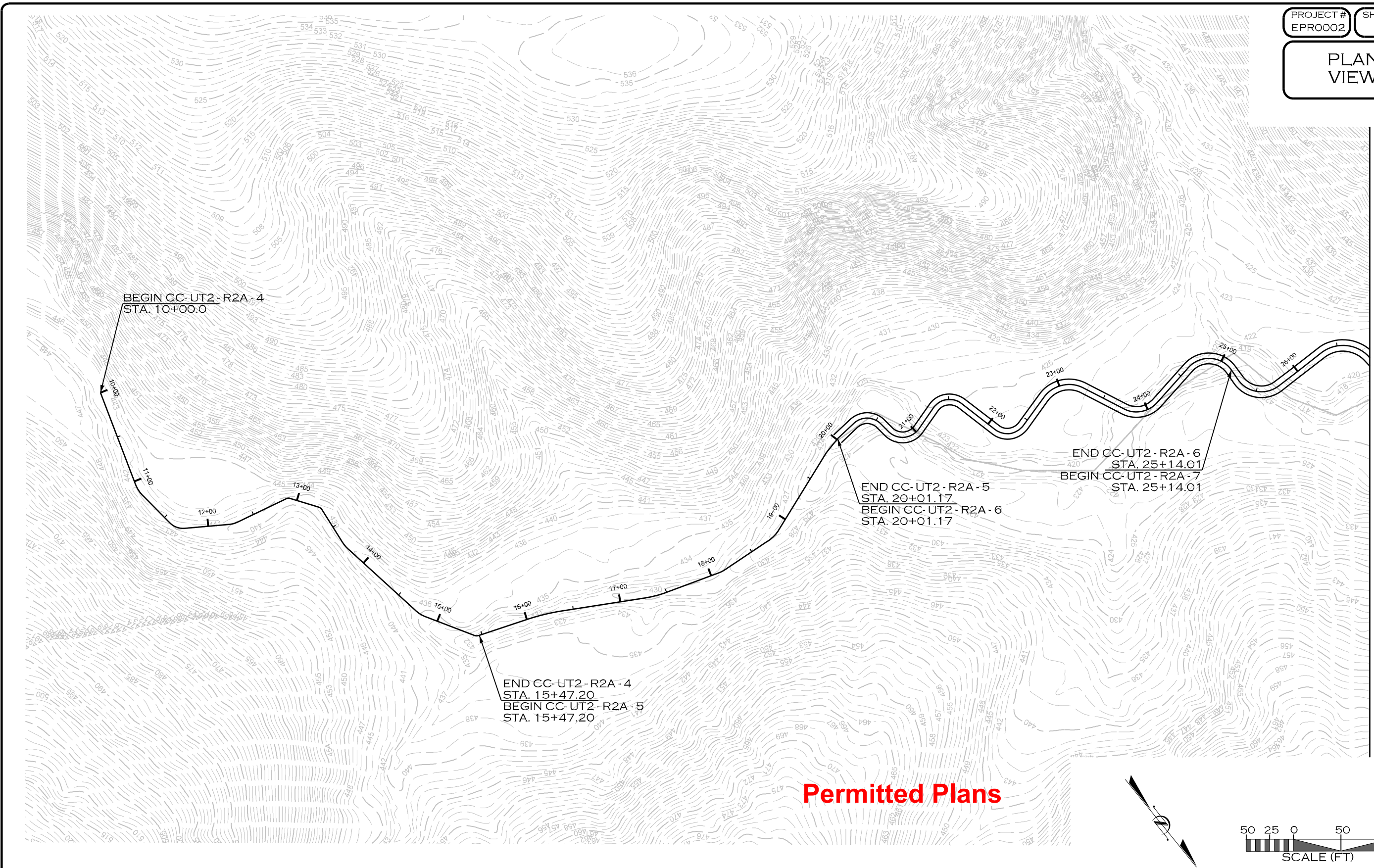
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MADON

REVISIONS				
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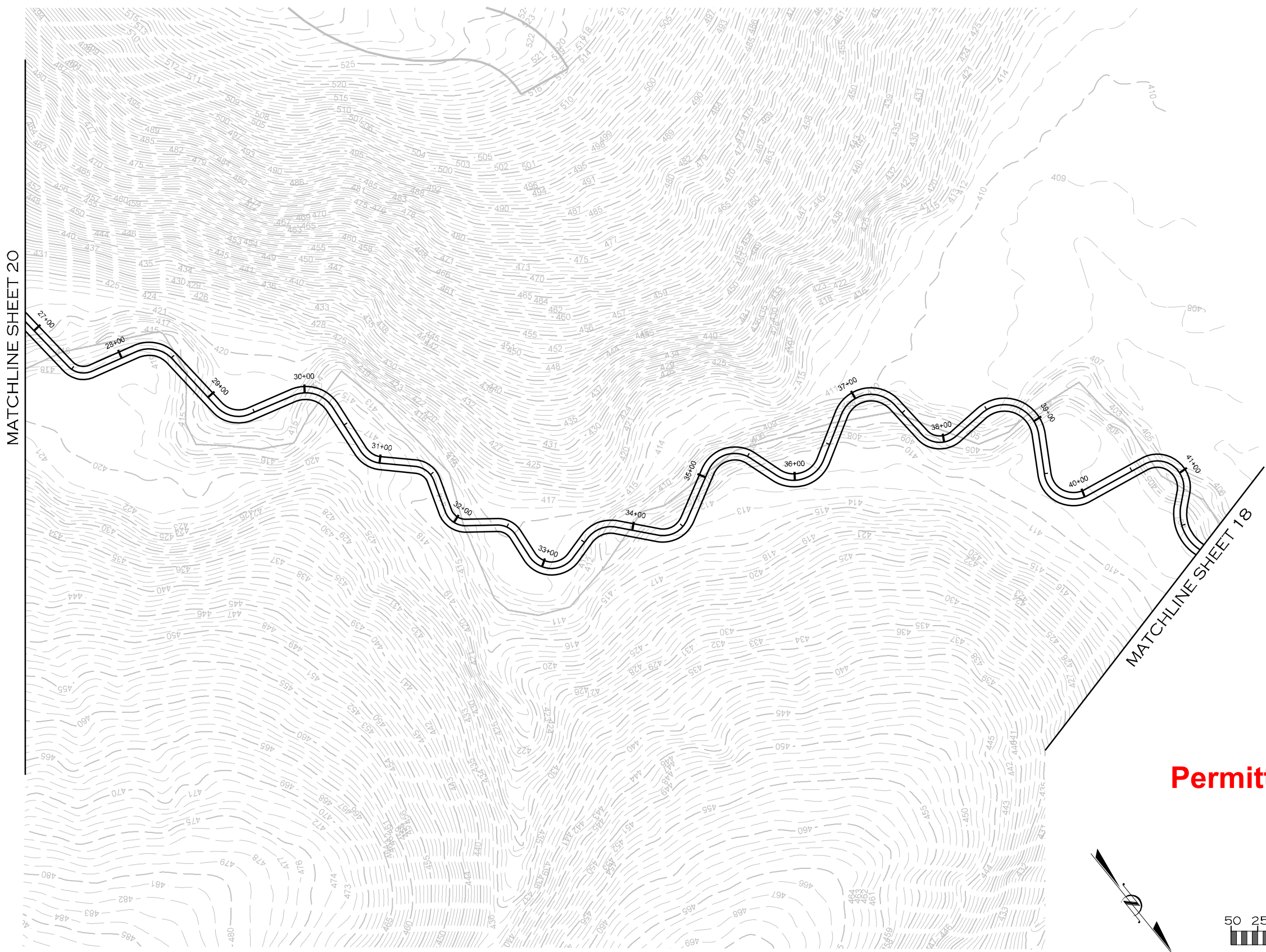
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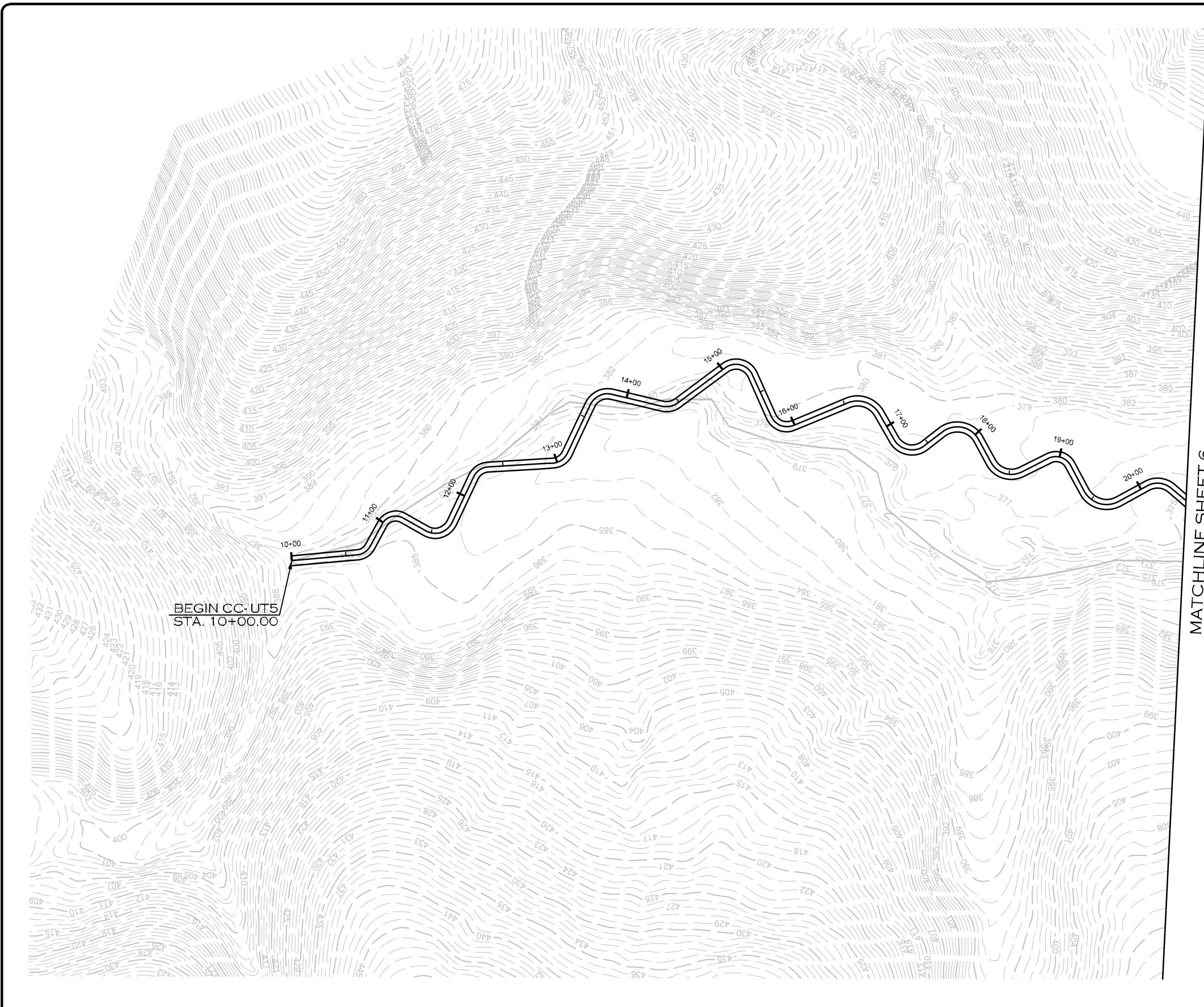
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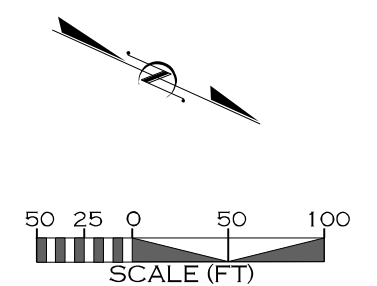
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RESTORATION

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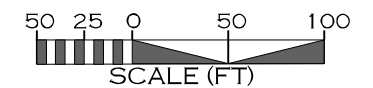


PLAN  
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MATCHLINE SHEET 24


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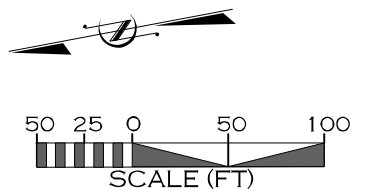


MATCHLINE SHEET 23

MATCHLINE SHEET 7



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